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THE NEUROGENIC BLADDER IN SPINAL CORD INJURY

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TRAUMA to the spinal cord has assumed a prominent place amongst the serious war injuries. In the past, the commonest cause of death in those who survived the immediate effects of this injury has been urinary tract sepsis. Disorder of bladder function constitutes a major disability and the most important problem with which to contend. Success or failure in the management of the paraplegic patient is therefore directly dependent upon the management of the paralyzed bladder. This paper is based upon the treatment of 30 cases of neurogenic bladder in spinal cord injury most of whom are battle casualties.

Before discussing the management of this condition, it is well to summarize the accepted views of nerve supply and bladder mechanism.

1. *Afferent nerves* (Fig. 1).—(a) Impulses come from stretch receptors in the bladder wall, pass along the pelvic nerves to the posterior roots of sacral segments II, III and IV. These fibres constitute the afferent limb of the reflex arc (1) which is directly concerned with micturition.

(b) Afferent fibres pass along the hypogastric nerves and associate themselves with the lumbar sympathetic chain. These impulses carry sensation of pain and are not essential to bladder function.

(c) Afferent fibres pass from the bladder neck and posterior urethra along the pudendal nerve. This constitutes the afferent limb of reflex arc (2).

2. *Efferent nerves*.—(a) Parasympathetic nerves arising from the lateral horns of sacral segments II, III and IV take part in the formation of the pelvic nerve and enter the vesical plexus whence motor fibres extend to the detrusor muscle and inhibitory fibres to the internal sphincter. This constitutes the efferent pathway of reflex arc (1).

(b) Sympathetic fibres from the hypogastric plexus innervate the blood vessels and are traced to Bell's muscles and the trigone. They have vasomotor and sexual functions in relation to the bladder and urethra but have no essential participation in normal micturition.

(c) Somatic fibres from sacral segments III and IV pass in the pudendal nerves to innervate the striated muscle around the urethra and external urethral sphincter. This constitutes the efferent limb of reflex arc (2).

Normal bladder mechanism.—Normally, micturition is a reflex act under voluntary control. Completion of this arc is within sacral segments II, III and IV. This region of the cord begins at the level of the first lumbar vertebra and constitutes the bladder nucleus. At first,

there is reflex contraction of the detrusor muscle with reciprocal relaxation of the internal sphincter—Reflex (1). This, in turn, sets up an afferent impulse which passes to sacral segments III and IV and leaves as a motor impulse through the pudendal nerve. This causes relaxation of the external sphincter and micturition begins—Reflex (2).

Abnormal mechanism.—A lesion above the bladder nucleus or supra-nuclear lesion will leave the spinal reflex arc intact while a lesion through the cauda equina or conus results in destruction of the reflex arc. The neurogenic bladder resulting from spinal cord injury

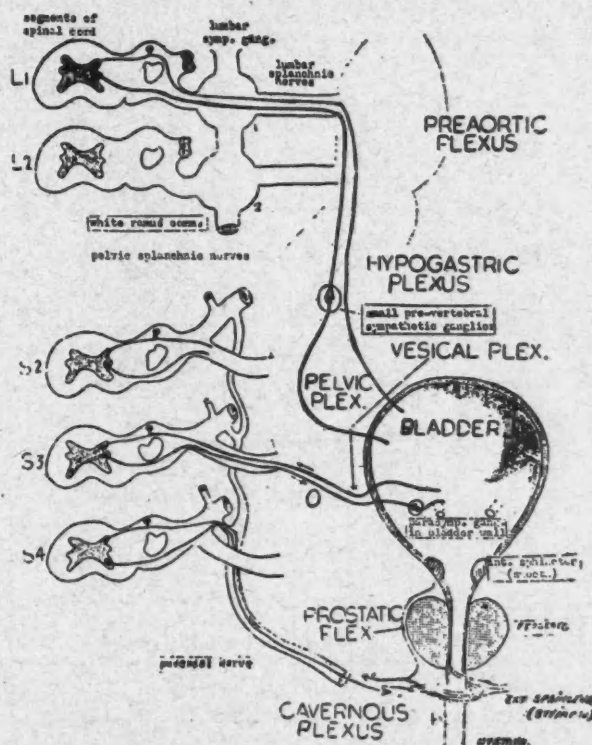


Fig. 1.—Nerve supply of bladder and urethra.

will ultimately assume a definite pattern depending upon the site and completeness of the lesion.

The stages of bladder recovery following spinal cord injury may be traced by repeated cystometric examinations and graphically recorded. In a typical case of complete transection above the bladder nucleus, the following stages occur in succession.

1. *The atonic neurogenic bladder* (Fig. 2).—Spinal shock is an accompaniment of all spinal cord injuries and results in a temporary unpredictable state of all reflex activity below the level of the lesion. In every case the bladder becomes atonic. The detrusor muscle is flaccid, the internal sphincter remains closed in reciprocal relationship and urinary retention develops. Urine ultimately dribbles away as overflow incontinence but the bladder may stretch to a serious degree before this occurs. This period of bladder atony lasts from a few days to a few months.

2. *The autonomous neurogenic bladder* (Fig. 3).—Both limbs of the reflex arc have been severed from the spinal cord and the bladder becomes self-governing. The internal sphincter is relatively hypertonic and detrusor contractions are insufficient to produce emptying. Evacuation is inefficient and residual urine may amount to 40% of the fill. Voluntary straining or suprapubic pressure may assist micturition. Both voluntary and reflex activity of the external sphincter are absent. This type of bladder constitutes the final pattern in complete lesions of the cauda equina, and an interim pattern in complete lesions above the bladder nucleus.

3. *The hypertonic neurogenic bladder* (Fig. 4).—There is frequent involuntary micturition with small bladder capacity and little or no residual urine.

Fig. 2

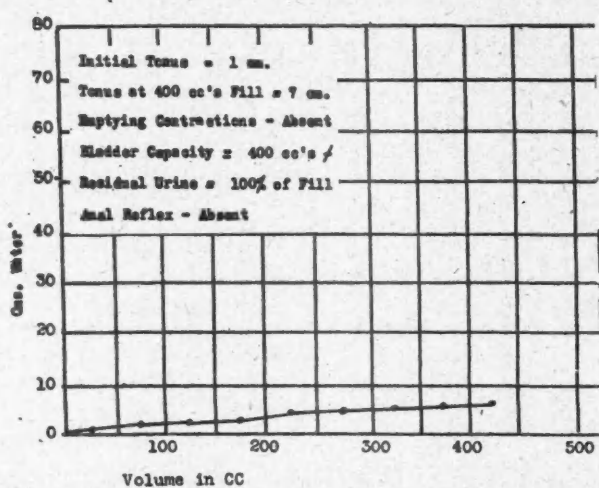


Fig. 3

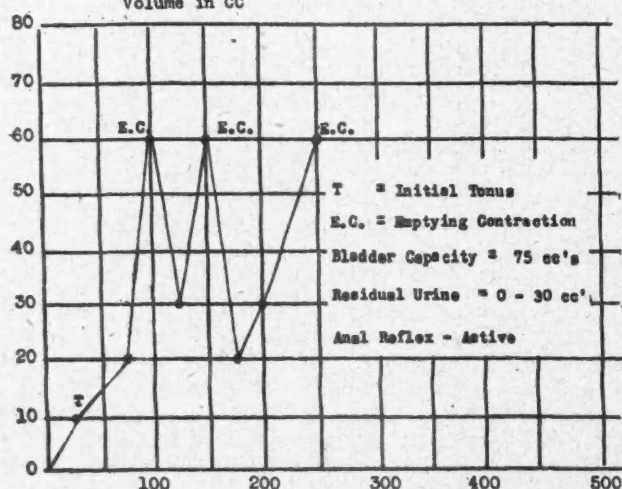
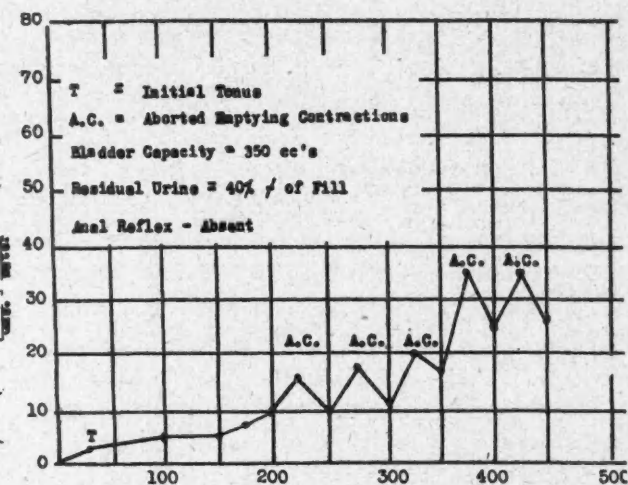


Fig. 4

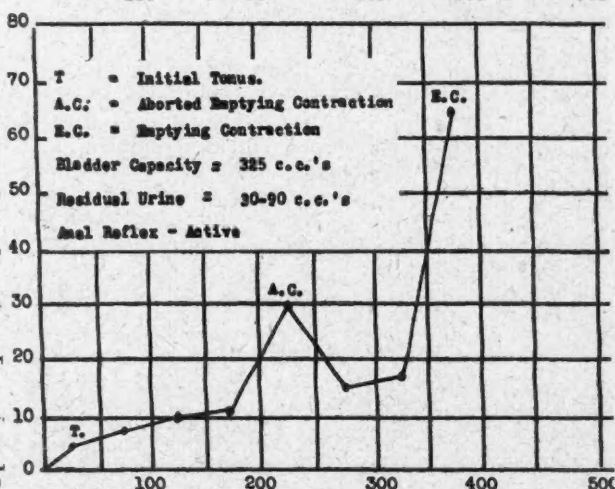


Fig. 5

4. *The uninhibited reflex neurogenic bladder* (Fig. 5).—This is commonly known as the automatic bladder. Activity of the bladder is governed by a spinal reflex completely dissociated from cerebral control. A given amount of fill will always produce an emptying contraction. External sphincter action is reflexly normal resulting in closure with cessation of micturition. The urinary stream is forcible and a considerable quantity may be passed at one time. Residual urine is usually 1 to 3 ounces although at times the bladder empties itself completely. The act may be interrupted for relatively short periods prior to completion or brought on by external stimuli when the critical point of fill has been reached. Violent contraction of abdominal muscles and flexors of the lower limbs (mass reflex) may produce premature micturition.

TREATMENT

Treatment is designed to prevent infection and over-distension and to ultimately produce the most practical type of bladder for the particular spinal cord lesion.

The immediate necessity is to transport the patient to a hospital where proper organization for the treatment of this condition is available. Some form of drainage should be established as soon as practicable. Intermittent catheterization

is condemned because it increases the hazards of trauma and infection. If facilities are not available for continuity of treatment as would apply in active service a suprapubic cystostomy should be done. The opening in the bladder should be as high as possible so as to obtain a leak-proof fistula and facilitate closure when this becomes necessary. In these circumstances, this constitutes safe and effective treatment. On the other hand, if conditions are ideal from the beginning, continuous urethral drainage may be

instituted with tidal irrigation. As a preliminary to either form of treatment, if this cannot be carried out within a reasonable time, a urethral catheter should be inserted and connected to a closed system of irrigation and drainage.

The following is a detailed description of the methods we have used in the treatment of the neurogenic bladder.

TIDAL IRRIGATION

Tidal irrigation with cystometric control is used in all closed cases with urethral catheters. This implies the automatic filling and emptying of the bladder at a predetermined level of intravesical pressure. This method is physiologically sound because it tends to simulate normal bladder activity. The object of tidal irrigation is: (1) To prevent or minimize infection. (2) To maintain normal bladder capacity. (3) To regain tone by passive exercise.

The instrument used, with minor alterations, is that devised by Donald Munro and modified by MacNeill and Bowler and Stewart (Fig. 6). It is a combined tidal irrigator and cystometer. The apparatus is described in detail by Donald Munro in *Medical Physics*. Certain features are

herewith noted, which include some improvements facilitating its use.

The reservoir consists of a 100 c.c. Kelly flask suspended from an upright metal bar fastened to the foot of the bed. An air-tight Murphy drip intercepts the rubber connection and a Hoffman clamp regulates the rate of flow of fluid from the flask.

The tidal irrigator stand consists of two parts: V.U.—a vertical upright 5" x 36" with 2 vertical parallel slots, mounted on a wooden base. B.A.—a board 5" x 56" fixed to V.U. with 2 stove bolts and wing nuts threaded through the vertical slots. The tidal assembly is fastened to board B.A. By sliding B.A. upon V.U., zero point on the manometer may be adjusted to correspond to pubic level on the patient. A meter stick with a small sealed glass tube incompletely filled with water, fastened to its centre, is used as a level.

The capillary tube or air vent is less than 1 mm. in diameter and the cystometer tube is 3 mm. in diameter. The siphon tubing is fastened at the desired height above pubic level. The cystometer tube is clamped off during tidal irrigation.

The waste bottle should have a rubber stopper with two perforations, one as an air vent, the other to admit the end of the siphon tube. This tube is adjusted so as not to pass below the level of the stopper. In this way the open end of the siphon will never get below the top of the fluid in the waste bottle. All tubing must remain on the bed and kinks or loops hanging below bed level are to be avoided. The apparatus is taken down, cleaned and sterilized once a week.

A No. 18 Foley urethral catheter has been found very serviceable. It has been stated that pressure of the fluid-filled bag upon the bladder may give rise to necrosis. This can be avoided by preventing any pull upon the catheter. It has the advantage of ac-

- M.B. Upright Metal Bar
- K.F. Kelly Flask
- M.D. Murphy Drip
- F.C. Foley Catheter
- S.T. Siphon Tube
- W.B. Waste Bottle
- H.C. Hoffman Clamp
- V.U. Vertical Upright
- V.S. Vertical Slot
- B.A. Board with Tidal Assembly
- C.D. Carrel Dakin Tube
- Z.L. Zero Level on Manometer
- C.T. Cystometer Tube
- C.T. Capillary Tube

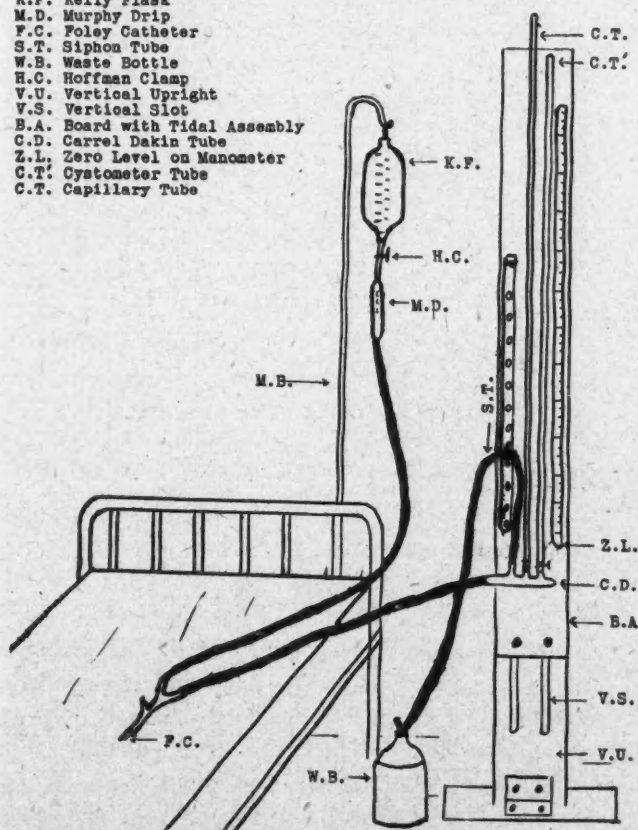


Fig. 6.—Combined tidal irrigator and cystometer.

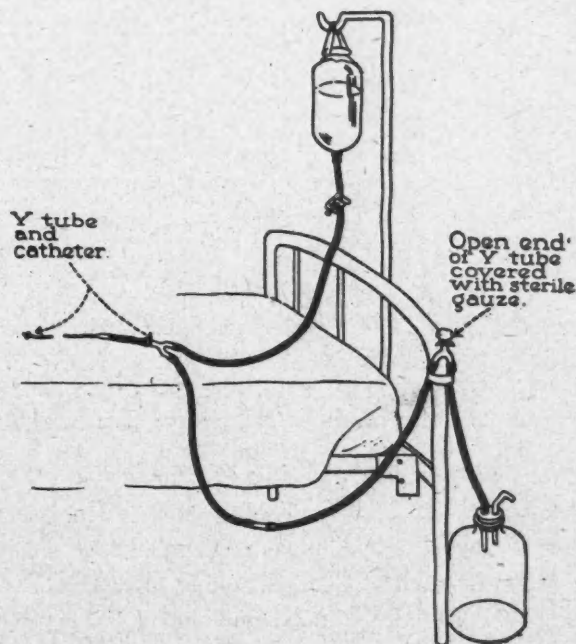


Fig. 7.—Aseptic irrigator-drainage system.
(After Nesbit).

curate adjustment and requires no adhesive strapping. The head of the penis is wrapped in gauze soaked in 1/10,000 potassium permanganate solution changed twice daily. This keeps the glans and urethral meatus clean at all times. The catheter is changed once a week.

Solution G has been used for irrigation. This is composed of: Citric acid (monohydrous) 32.2 gm., magnesium oxide (anhydrous) 3.8 gm., sodium carbonate (anhydrous) 4.4 gm., distilled water ad 1,000 c.c., pH = 4.0.

This solution is well tolerated by the mucosal lining of the bladder and helps to decrease the urinary pH to bacteriocidal levels. It is a prophylactic against alkaline encrustation and reduces to a minimum mucous debris which constitutes such a deterrent to successful tidal irrigation. When it is noted that bladder urine remains clear for a week or more, half strength of this solution is substituted. The rate of inflow into the bladder should be approximately 40 drops per minute.

CYSTOMETRY

A cystometric examination is carried out every two weeks. The tidal irrigator is converted to a cystometer by clamping off the siphon tube and releasing the clamp from the manometer. Fluid inflow should never exceed 120 drops per minute, an attempt being made to approximate as closely as possible the physiological rate. The method followed is that described by Donald Munro in *Medical Physics*. The following data are recorded. (1) *Initial tonus*. Intravesical pressure at 25 c.c. fill. (2) *Emptying contraction*. There is a sudden rise of pressure above 60 cm. of water and leakage may occur around the catheter. (3) *Aborted emptying contraction*. This is an inefficient detrusor contraction. (4) Bladder capacity. (5) Residual urine. (6) Reflex activity of the external urethral sphincter. This is assessed by noting the anal reflex.

After completion of the cystometrograph, the height of the siphon tube is adjusted. For an atonic bladder, the top of the siphon is usually set at 2 cm. For an autonomous bladder 2 to 10 cm. For a hypertonic bladder 20 to 30 cm. For an uninhibited reflex bladder 10 to 15 cm.

A series of cystometrographs are illustrated to indicate the successive stages of bladder recovery. Subjective impulses recorded in the normal are unreliable in the neurogenic bladder.

THE SUPRAPUBIC CATHETER

Patients who have returned from overseas with suprapubic tubes are connected to a closed system of irrigation and drainage (Fig. 7). The tube is changed every 10 days. By this method the patient may irrigate his own bladder at frequent intervals, the rate of inflow being regulated by a Hoffman clamp. Normal bladder capacity may in most cases be maintained by this method. In a few cases where there is evidence

of diminished capacity, the suprapubic tube is connected to a tidal irrigator and this method works admirably well.

Two methods are used to assess bladder activity: (1) Cystometric examination through the suprapubic tube. (2) By pulling up the suprapubic tube and clamping, the mushroom end makes a watertight closure of the fistula. Reflex activity of the bladder is noted by its ability to empty itself at regular intervals. Residual urine is measured by releasing the clamp following micturition.

Change from the suprapubic to the urethral catheter is indicated when the following criteria are satisfied. (1) General condition is satisfactory. (2) Urinary infection is minimal. (3) There is evidence of reflex activity. (4) X-ray examination reveals no evidence of stone. It is obvious that a stone in the bladder is more easily dealt with before closure of the fistula.

A No. 18 F. Foley catheter is introduced *per urethram*, connected to a closed system of irrigation and drainage (Fig. 7), and usually within 10 days or less the fistula is closed. Not a single case in this series has required surgical intervention. This is followed by tidal irrigation.

Other measures to prevent urinary infection and stone formation.—(1) Forcing of fluids counteracts stasis by producing a steady flow of urine. The minimum should be 3,000 c.c. in 24 hours. If difficulty is experienced in taking this amount by mouth, it should be administered intravenously.

(2) Serious infection and stone formation are more likely to occur in an alkaline urine. Urinary acidity is maintained by the oral administration of dilute hydrochloric acid. A pH level of 5.5 to 6 is considered satisfactory; this is frequently checked with nitrazine paper. In cases infected with urea-splitting organisms, it may be impossible to obtain an acid urine and other measures are necessary to overcome infection.

(3) Stasis is controlled by adequate drainage. In the early stages the patient is turned on his face four times in 24 hours and spends 6 to 12 hours in this position. The minor calices constitute the most dependent part of the kidneys when the patient is on his back and it is at this site that precipitation occurs. The value of turning the patient can thus be appreciated.

(4) Routine administration of high dosage of vitamin A, reinforced with B, C, and D and a high protein diet.

(5) Bacteriological control enables intelligent treatment in cases that do not respond to usual measures. Bacteriuria is noted in all cases with indwelling catheters but does not necessarily produce clinical evidence of infection. An established infection is associated with an alkaline urine and gross pyuria. In a bacteriological survey in this series of cases, including direct smears and cultures of urinary sediment, the commonest organisms found were *B. esch. coli*, *B. proteus vulgaris*, *enterococcus* and *B. aerogenes*. Gram-positive cocci were frequently found by direct smear.

Sulfathiazole is routinely used where there is clinical evidence of infection. Penicillin has proved of value in some sulfa-resistant cases; these were predominantly coccal infections. One case in which the *Strep. faecalis* was grown responded to mandelic acid following intense acidification.

(6) Intravenous pyelography reveals a wealth of information and is routinely performed on all cases.

FACTORS THAT INTERFERE WITH EXPECTED PROGRESS

(1) Disease within the urinary tract. Not only does progress cease, but there may be a regression to the initial state. (2) Disease outside the urinary tract and general exhaustion. Example—pulmonary disease. (3) Extensive bed sores; this complication may be minimized by moving the patient on a definite time schedule and keeping him completely dry at all times.

(4) *The mass reflex*.—In many cases of complete transection, minor stimuli set up powerful flexor contractions called the mass reflex. This causes micturition at unexpected times and prevents the development of a useful reflex bladder. To abolish this, Donald Munro has advocated an operation designed to convert a spastic into a flaccid paralysis—anterior rhizotomy. All the anterior roots from the 10th dorsal to the 1st sacral are cut intraspinally on both sides. In this series, 2 rhizotomies have been performed by Dr. O. S. Waugh, of the neurosurgical department, with very promising results.

END RESULTS

The ultimate genito-urinary results may be classified as follows:

The uninhibited reflex neurogenic bladder (Fig. 5).—This is the best result obtainable in complete transverse lesions above the cauda

equina. The catheter is removed and irrigation discontinued when the following conditions are realized: cystometry reveals evidence of reflex activity; infection and residual urine are minimal; bladder capacity is satisfactory.

A cystometric assessment of bladder capacity is always less than that noted after the catheter is removed. A capacity of 10 oz. is considered satisfactory. The interval between voidings is 2 to 3 hours, depending upon the amount of fluid intake. At the critical point of fill, some external stimulus such as massaging the suprapubic region will initiate micturition. It is obvious that an intelligent and well trained patient will make the best of these factors.

Before a reflex bladder stabilizes itself, there may be periods of relapse during which tidal irrigation again becomes necessary. A long period of observation and training is therefore required.

The autonomous neurogenic bladder (Fig. 3).—This is the final pattern in extensive lesions of the cauda equina. This type of bladder constitutes a urological problem for which no suitable solution is yet forthcoming. Periodic suprapubic compression with muscular straining produces only partial evacuation. The bladder becomes thickened and contracted and dribbling occurs. The use of an indwelling catheter on a permanent basis will ultimately result in serious complications. Advantage has been taken of the imbalance between the detrusor muscle and the spastic internal sphincter and a trans-urethral sphincterotomy has been done to relieve the obstruction. Encouraging results have been reported by some workers.

Suprapubic drainage if present from the beginning should be persisted in until it becomes evident that a useful bladder may be obtained by other methods. The tube is connected to a closed irrigation and drainage system (Fig. 7). If bladder capacity shows evidence of diminishing, tidal irrigation is applied from time to time.

The aim in all partial lesions of the spinal cord is to obtain a normal bladder with normal cerebral control. A bladder damaged by overstretching or persistent infection may never reach this desired state.

A small group of patients with destructive lesions of the spinal cord reveal evidence of having retained some minimal neural connections between the cord segments above and below the injury. These patients do not have a mass

reflex and receive a slight warning for a short period prior to micturition; they are amenable to further bladder training. These cases are classified as destructive lesions short of complete transection. Thirty* cases of neurogenic bladder have been treated at the Deer Lodge D.V.A. Hospital in Winnipeg. Twenty-one returned from the European theatre with suprapubic tubes. The remaining 9 were injured in Canada and were treated by urethral drainage.

methods have been used there has been more progress and fewer complications. So far there has been no mortality in this group.

CONCLUSIONS

Destructive lesions of the spinal cord are always associated with disorders of bladder function. If properly managed, it is possible in most cases to obtain a urinary end result that is compatible with relative comfort and good

TABLE I.
ANALYSIS OF 30 CASES OF SPINAL CORD INJURY

Site of lesion	Nature of lesion	Type of bladder	Complications
Cauda equina..... 8	Destructive lesions short of complete transection..... 4	Autonomous bladder... 4	Stone in bladder..... 1 Peri-urethral abscess... 1
	Partial lesions..... 4	Normal bladder..... 4	Stones in kidney..... 1 Stone in bladder..... 1
	Complete lesions..... 12	Reflex bladder..... 11 Autonomous..... 1	Stone in bladder..... 1 Stones in kidney..... 2
Thoracic..... 17	Destructive lesions short of complete transection..... 3	Reflex bladder..... 3	Peri-urethral abscess... 1
	Partial lesions..... 2	Normal bladder..... 2	Peri-urethral abscess... 1 Stone in bladder..... 1
	Complete lesion (Cv)..... 2	Reflex bladder..... 1 Retarded by pathology elsewhere..... 1	Peri-urethral abscess... 1 Stone in kidney..... 1 Right pulmonary Atelectasis.
Cervical..... 5	Destructive lesion short of complete transection (Cvii) 1	Reflex bladder..... 1	
	Partial lesions (Cv)..... 2	Normal bladder..... 2	

Patients in this series are between the ages of 19 and 35. The majority of injuries are the result of gun shot incurred in France after D day. Of 21 cases initially treated with suprapubic tubes only 2 have been permitted to remain. Both cases are destructive cauda lesions. Urinary calculi constitute the most important group of complications. All bladder calculi have been removed by litholapaxy. One nephrectomy has been performed for calculus pyonephrosis, while the 3 remaining cases are still under treatment. All 4 cases of peri-urethral abscess have drained and healed without stricture. There has not been a single case of epididymitis. At some time during treatment, every case has shown clinical evidence of infection; these have been successfully treated by methods already described. Many of these complications antedated the application of the therapeutic procedures described. It is felt that since these

health. An intelligent patient can easily learn the principles of tidal irrigation and will co-operate in its successful application. Other factors are involved in the rehabilitation of the patient but his ultimate happiness is dependent upon a good genito-urinary end result.

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* Six new cases have been added to this list.

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RÉSUMÉ

Les complications vésicales accompagnent toujours les lésions destructives de la moelle épinière et de la queue de cheval. 30 cas de lésions diverses sont rapportés qui furent traités par la cystostomie sus-pubienne et l'irrigation continue (*tidal irrigation*). Le type physio-pathologique de paralysie vésicale observé fera varier la technique de l'irrigation. La cystométrie doit guider les modalités thérapeutiques. Les malades peuvent apprendre facilement le maniement de l'irrigateur. Ces mesures visent, en somme, à éviter l'infection et la formation de calculs vésicaux et à obtenir un mécanisme vésical réflex qui donnera au malade un confort relatif.

JEAN SAUCIER

VOLKMANN'S ISCHÆMIC CONTRACTURE

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THE most generally accepted theory of the method of production of Volkmann's ischæmic contracture has been that held by Brooks.² This is that there is venous obstruction causing diffuse hæmorrhage amongst the muscle fibres. As a result of this there is an acute inflammatory reaction and later a diffuse fibrosis. However, production of the clinical syndrome by arterial ischæmia and massive necrosis of muscle has been proposed as the true mechanism.⁴ The present work is an investigation of these two conflicting views.

EXPERIMENTS

A blood pressure cuff was applied to a dog's leg and maintained at 120 mm. of mercury, which is between the dog's systolic and diastolic pressures, for as long as 7 hours. The limb beyond the cuff became swollen, blue, and cold but nothing more than a flaccid paralysis, lasting a day or two and followed by complete recovery, resulted. In an attempt to encourage hæmorrhage into the muscle, the leg was traumatized with a rubber hammer before applying the blood pressure cuff but still no contractures resulted. Clinical cases in which the constricting bandage was on much less than 7 hours yet with a resulting contracture have been reported.

Experimental production of contractures with a tourniquet has been reported.¹ The explanation was said to be that a narrow, hard, tourniquet injured the artery and caused widespread (collaterals) and sustained spasm.

The common and external iliac arteries of four rabbits were tied off repeating the experiments of Griffiths. One suffered only transitory weakness of the affected leg. An immediate flaccid paralysis resulted in the other three rabbits, one of which died with gangrene at the site of the incision in forty-eight hours. Sections of the muscle of the paralyzed leg of this animal showed complete disappearance of nuclei but otherwise good outline and structure. In other words a massive necrosis had taken place with only slight cellular reaction at the periphery. The endothelium of the femoral artery was destroyed and the artery was apparently functionless at this stage as the lumen contained no blood. The other two rabbits began to develop contractures on about the tenth day which were fully developed by the fifteenth day. Swelling and blueness of the leg were never noted. One rabbit was killed 55 days and the other 97 days after operation. In both, the affected muscles could be felt as a firm lump before death. When exposed these muscles were yellowish and quite firm in consistency. Sections revealed massive necrosis with fibrous tissue containing some macrophages and giant cells invading from the periphery of the necrotic muscle. The muscle itself was completely devoid of nuclei of any type but otherwise its structure was well preserved; indeed the cross striations were accentuated (Bowman's discs). (See Fig. 1).

CASE 1

McC., aged 10, supracondylar fracture of humerus, reduced after 3 hours and immobilized with only partial flexion at the elbow. Twenty-four hours after injury she was operated on because of paralysis and anæsthesia in the hand. No subfascial hæmatoma was found and the muscle appeared normal. There was good pulsation in the wound but no radial pulse. The skin was closed under considerable tension showing that tension in the deep structures had been removed by incision of the deep fascia. There was no radial pulse for two days. Good recovery gradually occurred. Biopsy (taken at operation 24 hours after injury) showed diffuse hæmorrhage, diffuse acute inflammatory reaction and some necrosis of isolated fibres or small patches of muscle.

CASE 2

E.M., 1934, fell from horse, compound fracture of forearm. 1937. Operated on for non-union. Within eight hours of operation a Volkmann's contracture had occurred. Sections taken at operation three weeks later showed large areas of complete necrosis of muscle. The nuclei of the muscle fibres had completely degenerated and only the outline of the muscle cellular

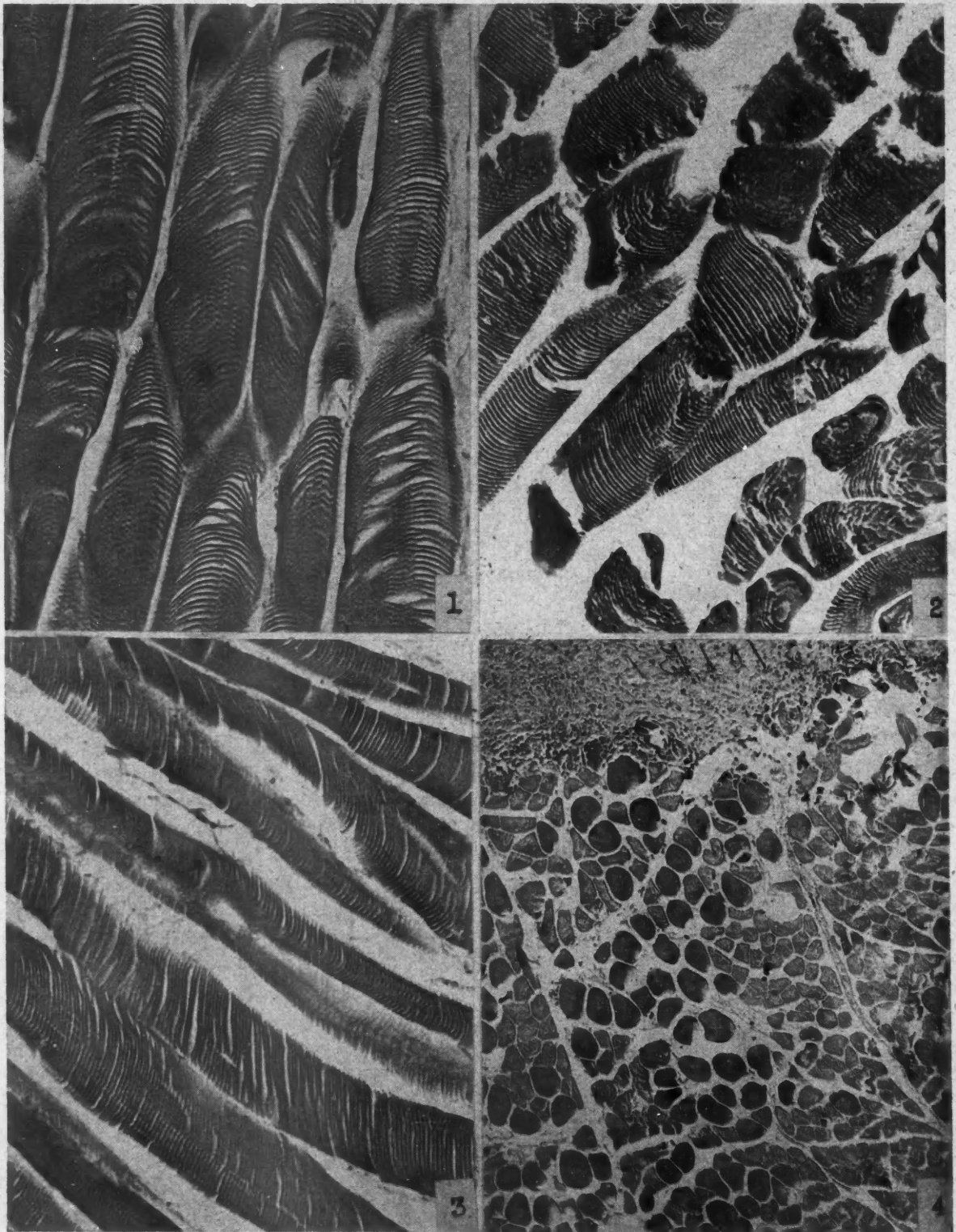


Fig. 1.—Necrotic rabbit muscle, 97 days postoperative. Longitudinal section, X300. Note complete absence of nuclei, preservation of outline of cells, and increased prominence of cross striations (Bowman's discs). Fig. 2. Case 3.—Ten weeks after onset of contracture, X300. Note absence of nuclei, preservation of outline and similarity to necrotic rabbit muscle and case 4. Fig. 3. Case 4.—Ten months after onset of contracture. Longitudinal section, X300. Note complete absence of nuclei, preservation of the outline of the cells, and increased prominence of the cross striations. Fig. 4. Case 5.—One year after onset of contracture. X-section, X60. Note similarity to experimental case—massive necrosis with invasion by fibroblasts and inflammatory cells from the periphery only.

structure was preserved. Inflammatory reaction was limited to the periphery of these areas of dead muscle.

CASE 3

R.G., aged 23, fracture of both bones of forearm, cast applied 8 hours after injury and split at once. Hand became numb and paralyzed and a Volkmann's contracture occurred. Biopsies taken at operation 10 weeks after fracture showed some fairly good muscle but other large areas in which there was massive necrosis (see Fig. 2).

CASE 4

W.G., aged 40, fracture of both bones of forearm. Circular cast applied for 5 days. Glove anaesthesia with only 3 inches' recovery of sensation in 10 months. Amputated at level of non-union 10 months after injury. Numerous sections from the amputated forearm showed massive necrosis with no evidence of inflammation or fibrosis of the dead muscle tissue except at its edge (see Fig. 3).

CASE 5

A.G., aged 40, fractured humerus and both bones of forearm. Plaster cast applied, removed after a few days because hand was dark. Ten days after injury the limb below and including the elbow was paralyzed, anesthetic and dark coloured. Four months after injury the thumb and index finger were amputated because of gangrene, and one year after injury amputation just above the elbow was performed. In the gross the muscles of the forearm were yellowish and of a firm gritty consistency. The nerves were shrunken and fibrous. Numerous sections of muscle again showed massive necrosis (see Fig. 4).

CASE 6

O.S., aged 15, fracture of both bones of forearm, circular cast applied, a severe Volkmann's contracture occurred. A sinus in the palm of the hand drained for over a year. The hand was amputated two years after injury. Sections showed dense intraneural fibrosis of the median nerve, and periarterial fibrosis of the radial artery. No muscle tissue was examined in this case.

SUMMARY

Four cases showed areas of massive necrosis with only pale outlines of muscle structure remaining, even after many months. There was no interstitial reaction within the muscle bundles and any inflammation or fibrosis present occurred at the periphery of the bundles. It is very difficult to see how such a pathological picture could have been created by venous obstruction, giving diffuse interstitial haemorrhage, inflammation, and then fibrosis. The resemblance of the histopathology of the human cases to the contractures produced experimentally by arterial ischaemia was marked.

Examination of the vessels in both the experiments and the human cases revealed that the main arteries were patent and functioning in all except one in which the animal died 48 hours after tying off the artery. In the three clinical cases from which sections of arteries were available their walls were somewhat thickened, chiefly the media, and the lumina were reduced in size.

The veins were patent and apparently functioning, there was no evidence of thrombosis.

The nerves in cases 4 and 5 showed dense fibrosis and disappearance of the neurolemmal sheaths.^{3,7} In case 3 and in the experimental animals the nerves did not show any change.

CONCLUSIONS

1. Volkmann's contracture is the result of acute interference with nutrition that might be either arterial or venous in nature. From our limited work there is some evidence to suggest it may be an arterial ischaemia.

2. Prophylaxis is most important but an understanding of the pathogenesis shows that some cases cannot be prevented by avoiding tight casts, etc. In the early treatment of these cases it is essential to realize the possibility of arterial obstruction as the cause of the contracture.

We would like to express our appreciation to Dr. G. Murray for initiating this investigation and for encouragement and assistance which made this work possible. We also thank those on the surgical staff of the Toronto General Hospital and the pathology staff at the Banting Institute who gave valuable assistance.

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In the history of medicine there are many names associated with the discovery of facts, with learned treatises, and with technical achievements of one kind or another; there are relatively few of whom we think especially as physicians, in the sense in which this word is used in regard to Sydenham, for instance. It is a rare blending of learning and humanity, incisiveness of intellect and sensitiveness of the spirit, which occasionally come together in an individual who chooses the calling of Medicine; and then we have the great physician.—Hans Zinsser.

FUNCTIONAL UTERINE BLEEDING***By Melville C. Watson, M.D., C.M.***Toronto*

FUNCTIONAL bleeding is a term used to describe uterine bleeding when there is no disease in the uterus itself. The bleeding is the result of tissue and circulatory changes in the uterus which have been induced by the internal secretion of the ovary. The ovary may or may not be diseased. In the majority of cases the ovaries are not diseased, even though temporary enlargement of one or other, or both, may be detected by bimanual examination.

Most women experience an interruption in the menstrual cycle of short duration on one or more occasions during their active reproductive period, apart from pregnancy. As the menopausal age is approached, functional bleeding affects a higher percentage of women. In many cases a bleeding cycle is established which is characterized by a period of weeks of freedom from sanguineous vaginal discharge followed by short or prolonged periods of spotting or active bleeding. The fact that these periods of bleeding frequently terminate spontaneously, has given rise to claims for success in treatment for both surgical and medicinal forms of therapy.

There are two main types which can be recognized by methodical history taking and careful clinical observations. Functional bleeding at the time of the menopause will be discussed in a subsequent paper. In both types discussed here, the patients show a well developed reproductive tract, well developed breasts and secondary sex characteristics. In other words, the long term effect of ovarian secretion from childhood to advanced puberty has been normal. It is the short term effect of the ovary which produces the recurrent preparation of the reproductive organs for a pregnancy which is temporarily interrupted. This definition of the types eliminates from this discussion all cases presenting abnormal development of endocrine glands or active tumours of the endocrine glands.

*Read and discussed at the Staff Meeting of the Department of Obstetrics and Gynaecology of the Toronto General Hospital on November 21, 1945, with presentation of cases.

TYPE 1

In the more common type of case the symptom functional uterine bleeding results from a low continuous secretion of oestrogenic substances by the ovary. These patients complain of vaginal spotting of blood following periods of brownish vaginal discharge, or active loss of dark blood, or even active loss of red blood, which have simulated a menstrual flow. The total period of sanguineous vaginal discharge may be continuous for days or weeks, at the end of which time a period of complete absence of bleeding will ensue and continue for a variable length of time which can be measured in weeks or months. Previous to interrogation this patient will proffer no other complaint. Following history-taking or repeated vaginal examinations at which the ovaries have been manipulated and tenderness from manipulation has been elicited, the patients are prone to exaggerate pelvic discomfort or dull pain in the right or left quadrant.

Other relevant facts from the history may be obtained. These are: (1) Absence of cyclic changes in the breast characterized by recurring sense of fullness and discomfort; rather one finds that the breasts remain flaccid in cases of very low oestrogenic secretion, or they remain tense, with tenderness and a stuffed feeling or sense of fullness during the period of acyclic ovarian activity in cases of more active oestrogenic secretion. (2) The bleeding comes on suddenly and the patient is caught unawares, just as with a nose bleed. None of the usual warnings accompanying the approach of a menstrual period, such as nervous irritability, emotional disturbances or pelvic discomfort usually relieved by menstrual flow, are experienced. The bleeding is usually unaccompanied by uterine pain, unless large endometrial polyps are present. Either the patient experiences no sensation at all at the time of bleeding, or she has a feeling of being permanently "stuffed", to use a common expression, both before, during, and after the period of vaginal bleeding.

The pelvic findings vary in degree in individual cases in the following main objective signs: (1) The external genitals and the vaginal epithelium do not appear to be congested, as a result of any unusual increase in local circulation. (2) The uterus, on repeated examinations, is not enlarged for the particular

patient, it is firm or hard in consistency, the lower uterine segment is firm, as is the cervix, and the whole organ can be palpated as one firm solid organ. (3) The ovaries may be palpated as normal size, one or the other or both may be definitely enlarged, firm, and tender. The above findings are constant over the period of time that the acyclic ovarian function persists, following which the enlarged ovaries (if present) will frequently become reduced in size. Endometrium obtained at curettage or biopsy shows the same picture whether obtained before, during, or after a period of bleeding, except for admixture with free blood, if obtained during the period of bleeding. The microscopic appearance varies from an atrophic type with slow tissue growth under low oestrogenic stimulation, to one showing a more active growth with thickening of the endometrium and a tendency to cystic formation in the glands,¹ deeper surface ulceration and polyp formation under a more active growth stimulus from slightly more active oestrogenic stimulation.² Blood or urine oestrogen determinations or examination of repeated vaginal smears will not add to the information obtained by clinical observations.

The blood loss from the uterus is seldom sufficient to cause a sudden fall in the red blood count or hæmoglobin estimation, unless there is active hæmorrhage from an endometrial polyp. Secondary anæmia only results when the bleeding periods are prolonged over weeks or months with no free period, during which the blood picture will rapidly return to normal for the particular patient.

TYPE 2

The second or less common clinical type of case in which functional uterine bleeding is the chief complaint is characterized by the following history and findings: The vaginal bleeding begins at or near the time of expected menstruation, and is described as a profuse menstrual period which is prolonged over the expected number of days. The blood loss is sufficient in amount to warrant the appellation of "hæmorrhage". The patient is usually suffering from an apparent secondary anæmia when she presents herself for advice and treatment. The history and findings are frequently justifiably confused with those associated with early abortion or ectopic. In contrast to the history obtained in Type 1, the patient does experience

breast symptoms and prodromal symptoms of approaching menstruation, frequently exaggerated to the extent that the discerning patient will recognize the symptoms as unusual, and in rare cases the pelvic discomfort simulates an intraperitoneal accident.

These patients should be properly prepared for pelvic examination with sterile technique. The vagina is first examined by using a bivalve speculum and removing all blood with sterile swabs. On bimanual examination the most striking observation is a softening of the cervix and lower uterine segment sometimes to the extent that the continuation with the fundus is difficult to recognize. The fundus is usually softened and enlarged for the patient, which can only be recognized if previous knowledge of the size of the organ has been recorded. One or other ovary is found to be enlarged and softened. The ovary may be included in a mass which is unrecognizable from a well-defined ectopic pregnancy. Vaginal packing may be necessary to control the bleeding as an emergency measure. The endometrium obtained by curettage during the bleeding period will show a full growth of matured endometrium with early functional or secretory changes, and an admixture of free red and white blood cells.¹

TREATMENT

The treatment in both types of cases should be conservative, particularly in women under the age of thirty-five who are hopeful of future pregnancies. There are, however, facts which favour radical surgical procedures in some cases. Parous patients over thirty-five years of age, who desire no increase in their families, and where there is definite evidence of trauma of the cervix with superimposed chronic infection and a degree of uterine enlargement may, when these facts are considered along with their economic state, be classed as suitable cases for total hysterectomy with conservation of the healthy ovaries.

Curettage is an essential diagnostic procedure in Type 1 cases where the bleeding periods have recurred over a period of ten weeks, and in all cases of Type 2, when active measures are necessary to control the hæmorrhage. Curettage aids as a therapeutic measure particularly when endometrial polypi are removed. In many cases uterine bleeding recurs at irregular intervals following this operation.

Once the state of the tissues in the endometrium has been determined, these patients should be kept under observation, with accurate written records of the time and amount of blood loss. Additional guides to future treatment are itemized below for emphasis.

1. A verbal history of blood loss from the vagina, particularly in the absence of a lowered haemoglobin or secondary anaemia, should never be taken as a basis for radical treatment in cases of functional uterine bleeding. These cases can be thoroughly examined and accurately observed with carefully kept records. Many cases will be convinced that the complaint has ceased to be troublesome.

2. Enlargement of the ovaries is a recurrent condition in both types of cases. Removal of healthy ovarian tissue is detrimental to either type of patient. Physiological enlargement of an ovary, or enlargement due to a haemorrhage into a follicle, is most definitely not an indication for removal of healthy ovaries.

3. Supplemental therapy with oestrogens and progestin is occasionally indicated in Type 1 cases, to force the endometrium through a complete proliferative, maturation, and functional phase, if troublesome continued bleeding recurs after one diagnostic curettage. If this form of therapy is undertaken, it should follow the course previously outlined,² of 10 to 20 thousand I.U. oestradiol benzoate for five to seven days, followed by 5 to 10 mgm. progestin for 2 to 4 days, keeping in mind the fact that vaginal packing may be necessary to control the bleeding which sometimes follows such a course of treatment.

4. Type 2 cases should never be given supplemental hormone therapy.

5. Treatment with thyroid extract is not beneficial to either type of case, and is contra-indicated unless based on sound medical grounds for improvement of general metabolic disturbances.

6. In Type 2 cases it may be necessary to pack the vagina for 24 to 48 hours to control bleeding on one or two occasions when bleeding recurs after one curettage.

7. There is up to this date no laboratory procedure (except microscopic examination of tissue obtained from the endometrium) which will augment information gained from a careful recording of facts in the history of the complaint, and meticulous physical examination. Laboratory procedures are of assistance in other

types of cases where the presence of secretory tumours is suspected.

8. It is perhaps unnecessary to emphasize that malignant disease affecting the ovary or the reproductive tract must be ruled out in all cases of uterine bleeding.

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RÉSUMÉ

Il existe deux types d'hémorrhagie utérines fonctionnelles: le premier est lié à l'exagération de la sécrétion d'oestrone; le second, moins fréquent, ressemble à une menstruation prolongée ou à une fausse couche et n'est pas sous la dépendance d'une hyper-sécrétion d'oestrone. Le traitement varie dans l'un et l'autre cas, mais dans les deux il doit être conservateur. L'opération sera décidée s'il existe des phénomènes inflammatoires chroniques. Le curettage diagnostique permet souvent de classer les types. Les oestrogènes et le progestérone seront parfois donnés selon les indications. La thyroïdothérapie est importante. Une histoire de cas bien faite est d'importance capitale. Il va sans dire que le cancer doit être soigneusement recherché dans tous les cas.

JEAN SAUCIER

A SURVEY OF THE OPHTHALMIC STATUS OF THE CREE INDIANS AT NORWAY HOUSE, MANITOBA *

By Wing Commander John V. V. Nicholls

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IN March, 1944, a survey was carried out by the author among the Cree Indians at Norway House, Manitoba, to determine the frequency with which ocular defects and disease occur. The Crees are traditionally a peace-loving people who have been forced northwards gradually through the last few centuries by more war-like tribes. Many bands of Crees are found today scattered over the unfertile bush country of northern Manitoba, north-eastern Saskatchewan and northwestern Ontario. The particular band visited for the purpose of this survey, is situated about historic Norway House at the northern tip of Lake Winnipeg. The land here is relatively unfertile, being composed of scattered muskeg and bush country. The Indians obtain a meagre existence by hunting and trapping. This fact has a double significance. They are exposed for long periods

* Read before the Section of Ophthalmology of the Canadian Medical Association at Toronto in May, 1944.

to the rigors of the climate and their diet contains relatively little fresh vegetables, dairy products and meat. The staple element of their diet is bannock, which is a sort of biscuit made from a mixture of white flour, lard and baking soda; sugar and tea and such fish and game as they can secure. The second point of significance is that any ocular defects seriously affect the already low standard of living by reducing the efficiency of the Indian when hunting or on his trap line.

In order to determine the means of improving the standard of living and the health of the Indian, a study was sponsored by the Department of Indian Affairs and by the Hudson's Bay Company. It consisted primarily in an investigation of the dietary habits and the nutritional status of the Indian. The study started in March, 1942, at which time Indians were examined, and groups were given various vitamin and food supplements. The present visit was one of a series and the first in which the author participated. It is recognized that the physical health and prosperity of these people are intimately interwoven. This survey was also of interest to the Royal Canadian Air Force, as it provided an opportunity to observe the effects of prolonged and repeated exposure to severe climatic conditions.

Between March 15 and March 22, 1944, 300 Cree Indians within reach of Norway House were examined. It is felt that this group represents as nearly as possible a random series. One hundred and three of the adults examined had been using vitamin supplements of one type or another for a period of one to two years as part of a nutrition study. All the school children examined were being supplied with a tablespoon of cod liver oil a day (800 I.U. of vitamin D and 8,000 I.U. of vitamin A). As far as could be found out, co-operation in the actual taking of the cod liver oil was good. It is to be pointed out that it is not justifiable to draw final conclusions regarding possible causal relationships between nutrition and ocular disease on the basis of data collected at this stage of the study.

In table I are recorded the age and sex distribution of the subjects examined. It is to be noted that in this table the subjects are divided into two groups, one being composed of those 5 to 18 years of age, and the other group composed of those 18 years of age and

older. They are divided therefore into those of school age and those older. This was done so that data might be obtained for comparison with the data collected by the writer in a previous survey among white school children in a rural community.^{1, 2}

Each patient was examined in good light and focal illumination for disease of the lids, conjunctiva, and anterior segment. Doubtful pa-

TABLE I.
AGE AND SEX DISTRIBUTION OF PATIENTS

Age	Male	Female	Total
Under 18 years.....	59	68	127
18 years and older.....	103	70	173
Total of all ages.....	162	138	300

tients were examined with the slit lamp. The visual acuity was determined for each eye separately. For this purpose the illiterate "E" chart was used most frequently, as the majority of the subjects were not familiar with their letters. The working distance was 20 feet. All subjects found to have a visual acuity less than 6/6 in one or both eyes were further examined and refracted under a cycloplegic. Ocular muscle balance was examined roughly for maximum excursion in the cardinal positions and for convergence power. Also a careful cover test was performed.

TABLE II.
AGE AND SEX DISTRIBUTION OF PTERYGIA

Decade	Incidence by decades		No. of cases
	% with pterygium		
3.....	7		7 out of 45
4.....	19		7 out of 37
5.....	37		16 out of 43
6.....	40		8 out of 20
7.....	42		5 out of 12
8.....	20		1 out of 5

Age	Male		Female		Total	
	No.	%	No.	%	No.	%
Under 18 years....	0	0	0	0	0	0
18 years and older.	30	29	10	14	40	23
Total of all ages...	30	19	10	7	40	13

The commonest abnormality found was pterygium, a fleshy, wing-shaped growth extending into the cornea from the bulbar conjunctiva. In Table II the age and sex incidence of this condition are recorded. It will be noted that it did not occur before the age of 18 years. The youngest patient was 19 years of age. Another pterygium was found in a pa-

tient 20 years old. From this age on the condition increases in frequency as shown in the table. Also pterygium was roughly twice as frequent in the male as the female, owing possibly to greater exposure to the elements in the former. In only one case was the pterygium extensive enough to interfere with vision by extending over the pupillary area of the cornea. Twenty-four of the subjects had been given various vitamin supplements, mainly vitamin A, and 16 were controls.

In this survey pinguecula, the yellowish raised areas of the conjunctiva due to hyalin degeneration of the subconjunctival tissue, were not found in the first decade of life, but became rapidly more frequent in the second decade and were practically universal thereafter. Duke-Elder³ believes that pinguecula and pterygia are not an extension of the same process, but that they have a similar etiology in that exposure to wind and dust are predisposing factors of the first magnitude. No evidence appeared in this survey to upset this point of view. However, one wonders if glare may not be another etiological factor. Certain it is that snow-blindness, which is a common ailment in this region, produces marked hyperæmia in pre-existing pingueculæ and pterygia.

Pterygium is looked upon as a degenerative process in the epithelium, Bowman's membrane, and even superficial layers of the substantia propria of the cornea. Schöninger⁴ believes that the earliest change that occurs in the cornea is the appearance of small vesicle-

like new formations at the points where the nerves pierce Bowman's membrane, and that these correspond to the islands of opacity seen clinically. In the present survey many patients with pterygium were examined with the slit lamp. These vesicle-like formations described by Schöninger were found in many of these cases; in many cases, they were not found or were found in cases where there was no pterygium.

In Table III is recorded the incidence of visual acuity defects in school-age Indian children and an analysis of the cases thereof. In Table IV similar data are recorded for

TABLE IV.

VISUAL ACUITY DEFECTS AT AGE OF 18 YEARS AND OVER

Cause	Male 103 cases		Female 70 cases		Total 173 cases	
	No.	%	No.	%	No.	%
1. Visual acuity less than 6/6 in one or both eyes.....	28	27	24	34	52	31
2. Causes of defective visual acuity:						
(a) Refractive errors	12	13	15	21	27	16
i. Hypermetropia...	4	4	1	1	5	3
ii. Hypermetropic astigmatism....	7	7	10	14	17	10
iii. Myopia.....	0	0	1	1	1	1
iv. Myopic astigmatism.....	1	1	1	1	2	1
v. Mixed astigmatism.....	0	0	2	3	2	1
(b) Corneal scars....	8	8	5	7	13	8
(c) Anterior staphyloma.....	0	0	1	1	1	1
(d) Pterygium.....	1	1	0	0	1	1
(e) Cataract.....	3	3	3	4	6	4
(f) Retinal disease...	2	3	1	1	3	2
(g) Primary optic atrophy.....	1	1	0	0	1	1
(h) Amblyopia ex anopsia.....	2	2	3	4	5	3
(i) Phthisis bulbi....	1	1	0	0	1	1

N.B. (f) One macular chorioretinitis, and two pigmentary macular degeneration.

Indians past school age. It is noticed at once that visual acuity defects greatly increase in the older group, being about twice as common as among the school children. This difference is mainly due to the vastly greater number of disease conditions in the older age group. There is also a slight increase in visual acuity defects owing to hypermetropia and hypermetropic astigmatism, as might well be expected. Among the children, refractive errors are by far the greatest cause of defective vision.

In comparing these data with those found by me among rural school children of white stock in two previous studies,^{1,2} it is noted

TABLE III.

VISUAL ACUITY DEFECTS UP TO 18 YEARS OF AGE

Cause	Male 59 cases		Female 68 cases		Total 127 cases	
	No.	%	No.	%	No.	%
1. Visual acuity less than 6/6 in one or both eyes.....	5	8	12	18	17	13
2. Causes of defective visual acuity:						
(a) Refractive errors.	3	5	11	16	14	11
i. Hypermetropia.	0	0	0	0	0	0
ii. Hypermetropic astigmatism....	1	2	6	9	7	6
iii. Myopia.....	1	2	2	3	3	2
iv. Myopic astigmatism.....	0	0	2	3	2	2
v. Mixed astigmatism.....	1	2	1	1	2	2
(b) Corneal scars....	1	2	2	3	3	2

N.B.—Patients in (a) had binocular defects with exception of one case.

Patients in (b) had monocular visual acuity defects.

that the overall incidence of visual acuity defects owing to hypermetropic astigmatism is about the same in Indian as in white children. However, among Indian children, this condition is more common among the girls, unlike the situation among white children. The total and sex incidence of myopic astigmatism is about the same in the two previous studies and in the present one. The incidence of myopia in the previous studies was 7.3% among the semi-urban children of the first study,¹ and 4.5% among the strictly rural children of the second study.² In both these studies it was about three times as common among the girls as the boys. In the present survey the incidence was 2%. Again it was more frequent among the girls, being nearly twice as common as among the boys. It is of interest to note that the children in this study are under a less determined educational drive than those of the previous two studies.

In the first of the two previous studies among white children, the total incidence of visual acuity defects was 30%, while under the strictly rural conditions of the second study the incidence was 15%, which compares closely with the 13% of the present study. Among the adults of the present study the incidence was 31%. Thus, it is seen that the Indian possibly has some visual advantage as a child, but that this is lost in adulthood. From a study of Table IV it will be seen that this loss is due mainly to the results of ocular disease. Experience indicates that the incidence of ocular disease among these Indians is high as compared with conditions in the average white colony. It is possible that with a higher standard of living, health education, and less exposure to the hazards of the trap line, this incidence might be greatly reduced.

In discussing disease conditions of the eye, it should be mentioned that three cases of retinopathy were found. In one there was an old inactive central chorioretinitis; the other two patients had fine pigmentary changes in the macula. In no case were arteriosclerotic changes found. This is remarkable when it is pointed out that 80 of the 300 patients were 40 years or older.

Fourteen patients were blind in one or both eyes, that is, they had less than 6/60 vision. In 3 cases the condition was bilateral. In 6, dense corneal scars were the cause (4 of these

were due to lime burns), in 2 there were cataracts and there was one case each of phthisis bulbi, strabismus, pigmented macular degeneration, primary optic atrophy, pterygium and anterior staphyloma. In all, 6 patients suffered from cataract; 3 male and 3 female. In one there was a nuclear cataract and in one a mature senile cataract. Both had been taking vitamin supplements. The remainder had posterior cortical cataracts, and had not been taking vitamin supplements. The average age was 59 years, with the youngest a female, being 38 years old and the oldest a male being 70 years old.

Among the adults corneal scars were the second greatest cause for loss of visual acuity. There were thirteen cases in all. Two of them had been given 50,000 I.U. of vitamin A and 5 had been given 9 mgm. of riboflavin by mouth per day, over a period of about 18 months. One patient had been given this dosage of both vitamins for a similar period. An analysis of corneal scars is found in Table V.

TABLE V.
MISCELLANEOUS OCULAR CONDITIONS FOUND
CALCULATED ON THE BASIS OF 300 PATIENTS

Ocular conditions	No.	Frequency %
1. Phlyctenular keratitis (active).....	2	0.7
2. Phlyctenular keratitis (inactive)....	4	1.3
3. Corneal scars owing to lime burns...	4	1.3
4. Corneal scars owing to trauma.....	2	0.6
5. Corneal scars, unknown cause.....	4	1.3
6. Strabismus.....	6	2.0
(a) Divergent monocular.....	2	0.6
(b) Divergent alternating.....	1	0.3
(c) Convergent monocular.....	3	1.0
7. Hordeola.....	3	1.0
8. Benign melanoma (conjunctiva).....	2	0.7

In regard to phlyctenular keratitis, it should be noted that there is a relatively high incidence of tuberculosis among these people. This and the low standard of living are well known etiological factors in this condition. There were four well authenticated examples of the scarring result of lime burns, and there were possibly two others. It should be noted that it is the common practice among the Indians to whitewash their houses. Though trachoma is common among the Indians in other parts of Canada, none was found in this survey.

It can be seen, therefore, that the Indians examined in this survey have basically good eyes and vision, but as age increases, this picture changes, owing to the increased inci-

dence of the effects of ocular disease. The reduction of the high incidence of ocular disease lies in the realm of preventive medicine, sociology and public health. No conclusions can be drawn at this time regarding the role played by nutrition deficiency in the incidence or variety of ocular diseases and disturbances found.

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RÉSUMÉ

300 Indiens Cris du Manitoba ont été examinés au point de vue de la fonction oculaire. Il ressort de cette enquête que les Cris ont une bonne vision dans le jeune âge mais que les maladies oculaires augmentent avec l'âge. Cet état de choses est apparemment lié aux conditions sociales et hygiéniques de cette tribu. C'est en améliorant ces conditions que la prophylaxie des maladies oculaires sera créée et deviendra opérante. Il n'est pas possible d'affirmer actuellement que les déficiences attribuables à une mauvaise nutrition jouent un rôle dans l'éclosion et l'évolution des maladies des yeux.

JEAN SAUCIER

HYPERTENSION AND ITS MANAGEMENT*

By W. Ford Connell, M.D.

Kingston, Ont.

HYPERTENSION is not a disease. But it is an important sign which may arise in the course of many and various disease processes. Some sixty conditions in all have been described which can be complicated by hypertension,¹ but this whole group accounts for only slightly more than 5% of all hypertensive persons, most of whose high blood pressure is of more devious origin and who have long been plastered with the label of essential hypertension. About this group our discussion will largely revolve. We must not forget however that a first step in the management of any hypertensive person is the painstaking search which must always be undertaken to uncover the mechanisms by which blood pressure elevation has occurred, for the reason that some of the causative factors, while rare, are remediable.

*Read at the meeting of Ontario Medical Association, Toronto, May 24, 1945.

Let us take a hypothetical case. A professional man of 38 is examined for life insurance and found to have a blood pressure of 145 systolic, 115 diastolic. He has no complaints, although he is working too hard and knows it. How should his case be studied? It is vital to determine that his hypertension is not due to such overt kidney diseases as glomerulonephritis, pyelonephritis, or some congenital renal anomaly, perhaps unilateral. In older persons, local and possibly remediable kidney disease can be ruled out by a negative history and physical examination, with absence of abnormal urinary findings and a flat plate of the kidney region which shows equal and normal kidney shadows. In young persons, cystoscopy with bacteriologic and microscopic study of the urine from both ureters and, of course, retrograde pyelograms should be carried out. If kidney lesions are demonstrated by this means, their effective therapy is of prime importance. It should be added, parenthetically, that the treatment advised should be such as would be used in the absence of hypertension. Disappointingly, hypertension has often, in fact usually, persisted following unilateral nephrectomy, and this operation is no longer advised for this indication alone.

The conditions already mentioned are not the only ones to which we should keep our minds open when we are studying an individual with hypertension. Tumours of the adrenal cortex—pheochromocytomas—have been found and removed with dramatically successful results in several patients at first thought to be suffering from "essential hypertension." Coarctation of the aorta might be mentioned as an interesting congenital lesion which, while not curable, should not be overlooked in our clinical study.

We have studied our patient and not by history, physical examination, x-ray or laboratory means has the cause of his elevated pressure been revealed. Thus, by that most unfortunate diagnostic process of exclusion, we arrive at the label "essential hypertension".

It is quite true that we do *not* know the cause of essential hypertension, but we have learned much about it, and we can formulate some useful working hypotheses. When we study these patients, we find that, as a group, they exhibit very strongly the symptoms and signs of nervous hyperreactivity. We can also often determine that this hyperreactive tendency is an inherited trait, often aggravated by child-

hood training and precept. These observations long ago led to the view that in these persons we were seeing prolonged overactivity of the vasomotor system, with increased peripheral vasoconstriction, leading to hypertension. For a time, following the work of Goldblatt,² Page³ and many others, which demonstrated that local vascular changes in the kidney were capable of setting in motion a humoral mechanism producing hypertension, this neurogenic theory almost fell into the discard. But while it is not entirely right, it is equally not entirely wrong. Today, we believe that much clinical hypertension is initiated by neurogenic mechanisms but that, sooner or later important humoral mechanisms step in and take over the job of maintaining and aggravating the abnormal vascular tension. Page⁴ has developed this hypothesis very clearly in his recent writings. According to him, we may classify the processes leading up to the established hypertension as follows:

1. Simple vasomotor lability: these persons are found to have transient and irregular episodes of elevated arterial pressure, chiefly systolic, associated with increased heart rate and usually some obvious emotional stimuli. If this group is watched over the years, not all by any means become hypertensive.

2. The pre-hypertensive group, it is believed, will all be recruited from those who manifest evident vascular hyperreactivity to such stimuli as oxygen deprivation, or the immersion of one arm in ice-water. From this group it is thought come those who sooner or later will show consistent blood pressure elevation, sometimes accompanied by such continued and increasing evidence of psychological and autonomic nervous system upset that the concept of at least a primary phase of

3. Neurogenic hypertension would appear well founded.

4. Early essential hypertension. As we watch our patients through the years and study them by various laboratory techniques, it becomes clear that, while renal excretory function remains normal, renal haemodynamics are in fact very much disturbed; that there are developing changes in renal blood flow, both quantitative and qualitative, and in consequence, pressor factors originating in the kidney are in fact circulating in the blood stream. To quote Page⁵:

"This may be the turning point in the hypertensive's life, as he passes from the easily reversible, labile state to one more fixed, more destructive and one far more difficult to treat. In broader biological terms, the sophisticated nervous control of the blood vessels gives precedence to the more primitive humoral control."

And now, to translate these etiologic concepts into clinical practice. We must recognize that most of our hypertensives become so through their reactions to their environment, to the stresses and strains of life in general. Their nervous systems are high-strung, hair-trigger. They are, most of them, hyper-conscientious worriers, who feel guilty when they are not doing something, who always cross their bridges before they come to them and who, in general, take life far too seriously. Now, all these persons do not come to a bad end at an early age. Most of them, in fact, do not even demonstrate hypertension till their fifties or sixties and, when it develops, the results are not always serious. We all know of patients whose hypertension is an accidental finding in their fifties, and who remain free of symptoms, to die of some totally unrelated disease twenty or even thirty years later. We also know that sometimes hypertension may develop with surprising rapidity in very young persons, increase with great speed and terminate fatally within a year or so of its first recognition. Between these two groups, the very benign asymptomatic hypertension of the aged, and the malignant hypertension of the young adult, fall the majority of cases. Here the course is run in 10 or 15 years from onset, and death occurs from one of the complications of hypertension, cardiac or cerebral.

How may the prognosis be judged in individual cases? Of the many factors to be considered, the age of the patient is one of the most important. The earlier that fixed levels of diastolic hypertension develop the more rapid is the course. Marked lability of pressure is always a feature of the early stages; as long as it continues, one may feel that the process is still potentially reversible and amenable to good management. Once the diastolic becomes fixed, and especially at readings of over 130 mm. Hg., the prognosis becomes very bad, and serious complications may with confidence be predicted in the near future.

In the assessment of complicating factors, a study of the heart is most important. Indications of coronary artery involvement are found in the presence of the anginal syndrome, often

very mild, and masquerading as indigestion. Even more commonly, we find manifestations of waning cardiac reserve,—with eventually the development of frank congestive failure.

Examination of the eye grounds is vital in assessing the status of the hypertensive patient. Here are mirrored those arteriolar changes which, widespread through the body, are responsible for the blood pressure elevation and its maintenance at an abnormal level. Ophthalmoscopic examination has given us, in fact, our most useful prognostic classification of hypertension. Mild or absent arteriolar changes are always to be expected in the cases who run a really benign course; patients with severe retinopathy have a life-span measurable in weeks or months, not years.

Study of the urinary tract has already been stressed in differential diagnosis. The average patient with essential hypertension never has any serious impairment of renal excretory function; this can readily be determined by his capacity to concentrate urine well under conditions of mild dehydration. The patient with malignant hypertension, on the other hand, rapidly develops severe renal involvement and his latter course is superficially indistinguishable from that of late glomerulonephritis.

When study of a patient with hypertension reveals no complications, a benign course may usually be expected if the condition has developed in the sixth decade or later. Hypertension in the young is notoriously of rapid progression. Here the rapidity of the course is presumably due to the initiation of a vicious circle at an early stage, whereby changes in renal blood flow are early productive of a strong humoral pressor component, which in its turn induces greater hypertension and still greater renal vascular change. Only thus can the course of so-called malignant hypertension be explained. It is possible for a malignant phase of rapid progression to supervene in any hypertensive person, even in the much older age group, but commonly when these older persons do poorly, it is because of complications which develop by reason of concomitant atherosclerosis of the coronary or cerebral vessels. It is these sclerotic changes then, which govern the prognosis in most cases and which are sometimes very hard to find until they have actually done their damage.

Our approach to the treatment of hypertension is a provisional one. We cannot talk

of cure of this condition until we fully understand the etiology. At the present time, rational management demands that we treat these patients as individuals and tackle the specific problems presented by each case. If we can do a good job of regulating the lives of these people, of improving their general health, of removing important environmental stresses, of correcting bad habits of living and working, of promoting more leisure, more relaxation, a better way of life, then we, and they, can forget their blood pressure and its vagaries. Patients who have high blood pressure and who know it (and there is no really good reason why they *should* know it except that if you do not tell them, someone else will or already has done so) should know much more about the condition. They already have learned from their kind friends of the rapid exitus this condition may sometimes promote, and of the strokes and heart disease which may complicate its course.

They should also be told, however, of the even commoner possibility; that an individual may develop abnormal blood pressure levels in his fifties, and live comfortably on without further signs and symptoms into a ripe old age. The unimportance of single readings, and the great fluctuations possible in the blood pressure level even in the course of a single day, must be stressed. So often the rather dramatic drops usually encountered on successive studies of patients are attributed to the particular therapy being employed and the patient is led to feel that the grim medicinal battle must go on and on, for fear the worst will happen. I am sure, too, that many people believe that the top of the manometer column represents the ultimate in blood pressure measurements and that when *their* pressure reaches the top, more than the machine will be wrecked. It would be very consoling to most of them to know that healthy arteries will stand a pressure, by actual measurement of, not 300 but 2,000 mm. mercury without turning a hair. Obviously, when strokes and heart attacks do occur, these complications are dependent on more than mere blood pressure elevation; the diseased and senescent arteries must take the blame. This, of course, is the reason why we ourselves should feel very happy when we find, in an individual past sixty, *only* blood pressure elevation and no good evidence of atherosclerosis. Such a patient, in the absence of symptoms, should receive *no medicinal therapy at all*, whatever his blood pressure

readings, attention being solely directed to such readjustments of his daily routine and of his life in general as would seem to be conducive to the process of "growing old gracefully."

Every hypertensive is not so fortunate as to be asymptomatic. Let us always ask ourselves, however, to what the symptoms are due. We may be dealing with a waning cardiac reserve or frank congestive failure. Here, our therapy is all directed to the failing heart. Other complications, too, must be handled as they arise and on their own merits. Most often, we have such pictures as ease of fatigue, palpitation, vague pains and fullness in the head. These are symptoms, not of hypertension, but rather of the chronic anxiety state which accompanies it. If these symptoms be due to nervous tension, then this, not the blood pressure, must be treated. As a matter of fact, many of these patients are suffering not from high blood pressure but from *fear* of high blood pressure. They have a true phobia. We all know these patients. Ask them of what they are complaining and they say "high blood pressure"; what they notice wrong with themselves and again the answer is "high blood pressure". For years, some of them have been battling against this persistent and malign foe. One week their pressure is 180—and that is bad; the next week, it has been triumphantly reduced to 170, and that is good; and there is a real celebration when it comes down to 150, and black despair when it jumps up again to 175! This is a pathetic and inexcusable state of affairs. A high blood pressure neurosis can be just as disabling as a cardiac neurosis, or any other severe psychoneurosis, and it is hard to treat after it has been installed for several years. Much can usually be done for these patients by thorough explanation and reassurance. Nerve sedatives alone, in this group, are only temporarily helpful and are never enough.

Are no drugs, then, of value in the treatment of these people? Certainly, the number of remedies which have been and are being used in this condition are legion. I wish I could say that some of them were worth while, but there is actually only one drug which can, in carefully selected cases, be counted on to give worthwhile benefits when properly used—potassium thiocyanate. This is such a "fussy" drug that it sometimes seems to be more trouble than it is worth, but a fair number of our patients would not agree. We never use the thiocyanates in

patients over sixty or in those with gross complications. It is equally contraindicated in benign, asymptomatic hypertension. There is, however, a group of patients with really severe headaches, and a subgroup who complain of tinnitus and vertigo, where this drug proves a really sovereign remedy. Actually, in one-third to one-half of the cases in which it is properly used, it materially reduces blood pressure levels and keeps them down with some consistency. There is another group in which this drug should be tried. These are the patients with relatively high diastolic pressures—115 mm. Hg. or higher—who show no advanced retinal changes but who, on recheck over the months, show evidence of increasing cardiac strain and are evidently not holding their own. Many of these cases seem to maintain useful health and avoid serious complications longer if their pressure levels come down under the influence of the drug.

We do not advocate thiocyanate unless patients can be carefully followed by estimations of blood level of the drug, which should never be allowed to rise above 12 mgm. %. Serious toxic effects and death from this drug have nearly always occurred when the blood level is allowed to get out of hand, because the cumulative capacity of even small doses in certain persons has not been properly appreciated.

And now a word about the surgical therapy of hypertension which, through the brilliant work of Smithwick and others is achieving such worthwhile results. I have recently had the pleasure of hearing this Boston surgeon summarize his experience to date using an extensive operation of bilateral supra- and infradiaphragmatic thoracolumbar splanchnic resection.⁶ This procedure, in the process of which both kidneys and adrenals are exposed and the former biopsied, has now been performed in some 600 cases with only 1% mortality, which figure has dropped to 0.2% in those cases treated in the past year. Apparently such an important part of the vascular system is thus prevented from hyperreacting that, in those in whom the humoral pressor mechanism had not become overwhelming, and who have not developed gross degenerative disease, the results are at least beneficial and at times even spectacular. No one pretends that in these operations we have the final solution of our therapeutic problem. However, in the younger victim of this disorder manifesting a rapid downward course and whose prognosis in the past has been

distressingly bad, this operation offers the prospect of at least turning the clock back a few years. Its ultimate usefulness can only be determined by a long follow-up of all the operated cases.

It would be nice to be able to give full progress reports on the very heartening studies now in progress on renal depressor extracts, amine inhibitors, anti-renin factors, and so on. Time does not permit, and unfortunately, to date, nothing has emerged which can be carried over into the field of practical clinical therapeutics. We have good reason to hope, however, that from this biochemical approach, will come the final solution of the hypertensive problem.

In the meantime, let us preserve our sense of balance. Let us realize that much of our therapy of these patients is really psychotherapy, conscious or unconscious, and let us see to it that it is good psychotherapy. If we are really honest with ourselves, we must visualize these patients as over-sensitive sounding boards, reacting with great vigour to all sorts of stimuli. The only reason so many drugs, dietary fads and what-not have achieved or are still achieving unwarranted reputations is that neither the extraordinary spontaneous fluctuations in blood pressure, nor the response to simple optimistic suggestion, of these people, has been adequately appreciated. I can only say that with full knowledge of all the claims made for massive vitamin A therapy, the rice diet, protein starvation, salt privation, watermelon seeds, garlic, the nitrites, liver extract, and so on, I still desist from dieting my patients, except when they are overweight, and from drugging them except for the specific indications laid down, and for complications.

In conclusion, remember that this great killer, hypertension, is only a malignant killer when it strikes the very young or middle-aged individual. Most old people over 65 have at least a mild degree of hypertension and many an oldster of 75 or 80 feels healthier and more vigorous carrying a blood pressure of 190/100 than does his friend with a reading of 110/70. The latter may live longer, but less comfortably. The former will not appreciate, and certainly will not benefit from meddling therapy. His prognosis depends primarily on how much vascular change he has in his heart or in his head, and no form of medication is going to alter it. In conclusion, let us always remember to treat the patient, not his blood pressure level.

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RÉSUMÉ

L'hypertension artérielle n'est pas une maladie mais un symptôme. Il s'agit donc de traiter d'abord le malade tout entier et de ne s'occuper de l'hypertension que comme s'il s'agissait d'une manifestation concomitante. En fait, l'hypertension n'est redoutable que chez les jeunes sujets et chez ceux qui ont en même temps le cœur et les vaisseaux malades. La thérapeutique médicamenteuse sera évitée sauf chez quelques malades choisis. La psychothérapie donne en général de meilleurs résultats que les drogues; il en est de même de l'institution d'un genre de vie qui amoindrit les efforts, la fatigue et les soucis. L'examen du fond d'œil et l'appréciation clinique du cœur et des vaisseaux sont les meilleurs critères de pronostic. JEAN SAUCIER

LA SANTÉ DES OUVRIERS

(Une appréciation des dangers auxquels la santé des ouvriers est exposée dans les industries de la province de Québec)

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EN 1938, environ deux ans après l'établissement d'une Division de l'Hygiène Industrielle au Ministère Provincial de la Santé et du Bien-Etre Social, le personnel de cette Division décidait d'entreprendre une enquête préliminaire sur les conditions de salubrité dans les établissements industriels de la province.

Cette enquête devait porter particulièrement sur les industries des villes de Montréal, de Québec et de Trois-Rivières et des régions avoisinantes. Il fut toutefois possible d'en élargir les cadres et d'y inclure un nombre assez considérable d'établissements situés dans les comtés ruraux de la province.

Des circonstances tout-à-fait incontrôlables retardèrent la rédaction définitive du rapport de cette enquête. Mais, ceci nous a permis de continuer ce travail d'investigation dans plu-

sieurs centaines d'autres établissements et d'ajouter substantiellement aux informations statistiques déjà obtenues.

La principale partie de l'enquête dura 4 mois; 3,384 établissements furent visités. Ces établissements employaient alors un total de 146,469 ouvriers et ouvrières; plus de 100,000 hommes et plus de 45,000 femmes. Les rapports fédéraux intitulés "industries manufacturières dans la Province de Québec" établissent que le nombre total d'employés, hommes et femmes, travaillant dans ces industries en 1938 était de 214,397. Le nombre d'établissements visités donne donc une image assez représentative des conditions de travail qui existaient alors dans les industries manufacturières de la province.

L'un des buts de cette enquête était de découvrir les divers risques auxquels la santé des travailleurs pouvait être exposée au cours de leur travail.

Afin de faciliter l'analyse de tous les renseignements obtenus, les établissements visités furent groupés en 16 genres principaux:

1. L'aéronautique et l'industrie de l'automobile.
2. L'industrie du bois.
3. L'industrie du caoutchouc.
4. L'industrie des comestibles.
5. L'industrie du cuir.
6. L'industrie de l'électricité et des métaux.
7. L'industries des fourrures et des feutres.
8. L'industrie du meuble.
9. L'industrie des minéraux.
10. L'industries des mines et carrières.
11. L'industrie du papier.
12. La polygraphie.
13. Les produits chimiques.
14. L'industrie du tabac.
15. La teinturerie et le nettoyage.
16. L'industrie du textile.

Chacun de ces groupes furent subdivisés suivant la nature des produits manufacturés ou des matériaux manipulés. C'est ainsi, par exemple, que l'industrie des minéraux fut subdivisée comme suit: ciment; brique, tuile et céramique; produits à base d'amiante; granit, marbre et produits à base de pierre; asphalt, et enfin l'industrie du verre.

Les dangers apparents ou possibles auxquels la santé des ouvriers était exposée dans toutes ces subdivisions furent déterminés en tenant compte de la nature des matières premières utilisées, de la nature des procédés et les méthodes de travail. Nous avons cherché à découvrir le nombre d'ouvriers exposés à chacun de ces dangers et le degré approximatif auxquels ils y étaient exposés. Afin de rendre la tâche plus facile aux enquêteurs, on leur recommanda d'apprécier chaque cas en se servant des ex-

pressions suivantes indiquées sur des formules spéciales: nombre d'ouvriers exposés à une "concentration excessive", à une "forte concentration", à une "concentration modérée", et à une "légère concentration". Evidemment, nous avons dû donner alors au mot "concentration" un sens assez large. C'est ainsi, par exemple, que l'expression "concentration excessive" s'appliquait littéralement en ce qui concernait les poussières, les gaz et les vapeurs. Mais pour ce qui avait trait au bruit, à la fatigue, à la température, etc., cette expression voulait dire tout simplement que l'ouvrier était exposé à cette condition de travail à un degré excessif.

Afin d'obtenir des enquêteurs une appréciation aussi uniforme que possible de l'étendue des dangers auxquels l'ouvrier était exposé, nous avons cru devoir préciser davantage le sens de ces diverses expressions: sous les mots "concentrations excessives", on rangeait toute concentration ou toute condition de travail à laquelle l'ouvrier était apparemment exposé d'une manière excessive. Une "forte concentration" signifiait toute concentration ou toute condition de travail qui, sans constituer un danger excessif pour l'ouvrier, comportait un danger probable pour sa santé. Sous les mots "concentration modérée" on classait toute les concentrations ou toutes les conditions de travail suspectes qui rendaient nécessaires une enquête minutieuse ou une étude plus approfondie. Par "concentration légère", on entendait toute concentration ou toute condition de travail à laquelle l'ouvrier était peu exposé et que l'enquêteur pouvait considérer comme passable et à peu près satisfaisante. Ces expressions évidemment faisaient abstraction du degré de toxicité, de la substance ou de la gravité intrinsèque de la condition en cause.

Il serait trop long de donner ici en détails pour chaque groupe d'industrie et pour chaque subdivision de ces groupes la liste des dangers auxquels la santé des employés de ces établissements était exposée et l'évaluation approximative de ces dangers. Nous nous bornerons simplement à mettre en relief les principales constatations qui résultent de cette enquête.

Un total de 155 risques principaux a été relevé dans les établissements visités au cours de cette enquête. On peut dire, sans crainte de se tromper, qu'une étude approfondie des conditions de travail dans ces établissements aurait permis de déceler un nombre encore plus grand

de ces risques. Les informations obtenues au cours de cette enquête préliminaire indiquent qu'un grand nombre d'ouvriers sont exposés au bruit à un degré plus ou moins élevé.

Lorsqu'on est exposé constamment à un bruit excessif, celui-ci finit par provoquer inconsciemment chez soi une fatigue même si on paraît s'y habituer. Le bruit excite, irrite et amène une tension nerveuse qui diminue la résistance et le rendement de l'ouvrier. Le bruit excessif expose aussi, avec les années, à la surdité. Des modifications bien simples dans les méthodes de travail suffisent parfois à diminuer considérablement le bruit dans les usines; il en résulte une économie de l'énergie nerveuse pour l'individu. Couvrir les murs et les plafonds de matériel qui absorbe bien le son; voir à ce que les installations mécaniques soient toujours tenues en bonne condition; isoler dans une salle spéciale les machines ou les procédés qui causent un bruit excessif; améliorer les planchers, de façon à ce qu'ils aient une surface bien unie; voilà quelques-unes des principales mesures qui contribuent à éliminer le bruit excessif dans l'industrie.

Dans certaines industries, telles que dans les chantiers maritimes où l'on fait du rivetage pneumatique, ou dans le forage minier souterrain, l'élimination du bruit constitue un risque évident pour l'appareil auditif. Dans ces cas, le seul moyen de protection consiste à utiliser des bouchons protecteurs spéciaux pour les oreilles.

Notre enquête a révélé que plus de 22,000 ouvriers étaient exposés à un bruit excessif au cours de leur travail, dont plus de 10,000 dans le textile et plus de 3,000 dans les industries métallurgiques. Un grand nombre d'autres sont exposés à l'humidité; un nombre assez considérable à la fatigue par suite de la nature des procédés, des méthodes de travail utilisées ou d'un défaut d'organisation dans l'usine même.

L'humidité excessive, et nous ne voulons pas parler seulement d'humidité atmosphérique mais de toute condition de travail où l'ouvrier est exposé à mouiller ses vêtements ou ses chaussures, peut provoquer chez le travailleur des maladies des voies respiratoires ou des affections névralgiques ou rhumatismales. On ne devrait pas négliger dans ces cas de lui fournir des vêtements imperméables, tels que chaussures de caoutchouc, tablier de caoutchouc, etc., et d'installer dans ces locaux de travail des canaux de drainage ou encore des plateformes lattées afin

d'éviter les accumulations d'eau sur les planchers. Plus de 19,000 ouvriers étaient exposés à une humidité excessive, dont plus de 8,000 dans l'industrie du textile, et plus de 3,000 dans les mines et carrières.

On a pu relever encore plus de 3,000 ouvriers qui étaient exposés à la chaleur sèche ou rayonnante dans l'industrie de la métallurgie. La chaleur rayonnante, comme on le sait, expose particulièrement au coup de chaleur, à l'épuisement par la chaleur (*heat exhaustion*), à des crampes musculaires et à des éruptions de la peau. Une bonne ventilation, des méthodes de refroidissement de l'air, des modifications dans les méthodes de travail, des vêtements protecteurs, des installations mécaniques spéciales, l'utilisation de substances isolantes sont autant de mesures destinées à diminuer les effets de la chaleur sèche dans l'industrie.

Les poussières constituent un risque important pour la santé des ouvriers dans les industries de la province. Dans les établissements visités un total de plus de 50,000 ouvriers étaient exposés à des poussières diverses. Evidemment, il ne s'agit pas là entièrement de poussières spécifiquement dangereuses pour la santé, mais il n'est pas désirable que l'ouvrier travaille dans une atmosphère chargée de poussière, même si celle-ci n'est pas toxique. Il convient de rappeler de nouveau qu'il s'agit ici de dangers apparents ou possibles seulement, car souvent, seule, une étude approfondie des conditions de travail peut établir si la santé de l'ouvrier est réellement exposée ou non.

On peut admettre que le problème des poussières constitue l'un des principaux problèmes d'hygiène industrielle à solutionner dans les industries de notre province. L'industriel, l'hygiéniste et la Commission des Accidents du Travail y sont intéressés au plus haut point. Des études antérieures ont démontré que mêmes les poussières qui ne sont pas spécifiquement dangereuses pour la santé peuvent augmenter les taux de morbidité par tuberculose ou par les maladies des voies respiratoires chez ceux qui les respirent en concentration assez élevée au cours de leur travail.

Mais ce sont les poussières de silice et d'amiant qui évidemment présentent le problème le plus épineux. Les mines, les fonderies, les établissements de tailleurs de granit sont, en général, de toutes les industries celles qui présentent le plus gros problème au point de vue des maladies causées par les poussières de silice.

Et ces industries se rencontrent en assez grand nombre dans notre province. Plus de 6,000 ouvriers étaient exposés aux poussières de silice dans les établissements visités. Ce chiffre toutefois est bien au-dessous de la réalité.

La Province de Québec est la seule du Dominion où l'on rencontre des mines d'amiante. Nous avons trouvé que plus de 2,000 ouvriers étaient exposés aux poussières de ce minéral.

Pour éliminer les poussières de l'atmosphère des locaux de travail, il est parfois nécessaire d'installer des systèmes de ventilation qui exigent une étude des plus minutieuse. Cette ventilation est basée sur l'aspiration des poussières à la source même où elles sont engendrées. Il faut tenir compte de la nature des poussières, du procédé utilisé, de la disposition des machines, etc. dans le choix d'un système de ventilation autrement on s'expose à ce qu'il ne donne pas satisfaction. Les personnes ou compagnies qui projettent de construire une usine où les procédées peuvent donner naissance à des poussières, à des fumées, à des vapeurs ou à des gaz dangereux, s'éviteraient bien des ennuis et bien des dépenses inutiles si, avant de commencer la construction de leur usine, elles venaient consulter les techniciens de notre Division afin d'en discuter les plans avec nos techniciens et les modifier au besoin, et rendre ainsi possible l'installation d'un système de ventilation général et local vraiment efficace.

Le second problème en importance et non moins épineux est celui des dermatites professionnelles. Environ 75% des réclamations qui sont adressées à la Commission des Accidents du Travail de Québec se rapportent à des cas de dermatites d'origine industrielle. Notre enquête a révélé que de toutes les matières premières ou substances que l'on rencontre dans les industries du Québec et qui sont susceptibles de causer des dermatites, le pétrole et ses dérivés ainsi que divers lubrifiants constituent celles auxquelles le plus grand nombre d'ouvriers sont exposés. Plus de 16,000 ouvriers étaient exposés à ces substances dans les établissements visités.

Le diagnostic de ces dermatites n'est pas par lui-même difficile à faire; mais en bien des cas il n'est pas facile de déterminer si la dermatite dont souffre l'ouvrier est bien d'origine industrielle. Afin d'obvier jusqu'à un certain point à cette difficulté, le Comité des dermatites industrielles de l'American Medical Association a suggéré, en 1942, des critères qui devraient aider à déterminer la relation de cause à effet entre

l'occupation et une condition anormale de la peau chez les ouvriers dans l'industrie.

Passons maintenant aux substances toxiques avec lesquelles les ouvriers viennent en contact et qui sont susceptibles de charger sous forme de poussières, de gaz ou de vapeurs, l'atmosphère des locaux de travail et de provoquer surtout l'empoisonnement chronique. Il semble que le plomb, le benzol et le mercure, à ce point de vue, constituent les trois risques les plus importants auxquels nos ouvriers sont exposés dans les établissements visités. Notre enquête a révélé que plus de 7,000 employés étaient exposés au plomb, plus de 6,000 au benzol et plus de 2,500 au mercure dans les industries visitées.

Quinze cas de saturnisme nous ont été rapportés en 1943 et vingt-deux en 1944. Nous avons toutes les raisons de croire que les cas de ce genre sont encore plus nombreux que ces chiffres ne l'indiquent.

L'importance que nous attachons aux problèmes que soulèvent ces substances toxiques dans les industries de notre province n'est pas tant due au nombre d'ouvriers qui y sont exposés comme aux lésions graves et permanentes qu'elles peuvent provoquer dans l'organisme.

Il est intéressant toutefois de constater, à la suite d'enquêtes faites aux Etats-Unis que, depuis une vingtaine d'années environ, il y a eu une diminution croissante des mortalités par le saturnisme. Mais la diminution du nombre des cas d'empoisonnement non mortels par le plomb n'a pas été aussi considérable et aussi constante que celle des mortalités causées par ce métal. On en a conclu que dans beaucoup d'industries où les ouvriers sont exposés au plomb on a réussi par certaines mesures d'hygiène à améliorer les conditions de travail sans toutefois arriver à établir un niveau de sécurité raisonnable. Aujourd'hui, grâce aux recherches et aux découvertes faites par les hygiénistes des moyens précieux sont à la disposition des industries qui permettent de réduire considérablement les dangers d'empoisonnement par le plomb chez les ouvriers.

En général, une surveillance médicale compétente, y compris les examens de laboratoire requis dans ces cas, de même qu'une étude technique répétée des conditions de travail, permettra de déterminer si l'ouvrier est exposé au plomb de façon dangereuse ou non.

On peut dire sans crainte de se tromper que le plomb et ses composés se rencontrent presque

partout dans l'industrie. En fait nous avons trouvé un nombre plus ou moins considérable d'ouvriers exposés au plomb dans tous les principaux genres d'industries, qui ont fait l'objet de notre enquête.

L'empoisonnement chronique par le benzol est beaucoup moins fréquent que l'empoisonnement par le plomb dans nos industries. Par ailleurs, le benzol est beaucoup plus toxique et les lésions qu'il provoque sont souvent mortelles. Si un ouvrier a présenté des symptômes d'intoxication par le benzol, il y a lieu après leur disparition, même si ces symptômes ont été légers d'exercer sur lui une surveillance médicale étroite parce que très souvent les lésions causées par ce produit continuent sournoisement de progresser et peuvent amener des accidents mortels.

Dans les établissements visités, le nombre d'ouvriers exposés au mercure est beaucoup moins élevé que ceux qui sont exposés au benzol. C'est surtout dans l'industrie chimique, l'industrie des fourrures et des feutres, et dans les industries métallurgiques que l'on rencontre cette substance toxique dans notre province.

Enfin notre enquête a révélé qu'un nombre d'ouvriers plus ou moins considérable sont exposés à bien d'autres substances toxiques dans nos industries. Les principales sont: le chrome et ses composés, les oxydes d'azote, le phosphore et ses composés, les cyanures, l'aniline, le barium, le cadmium, le naphta, le bisulfure de carbone, le tetrachlorure de carbone, le trichloréthylène, la benzine, l'oxyde de carbone, le zinc, le cuivre. Il faut remarquer qu'en bien des cas un ouvrier peut être exposé à plus d'une substance toxique à la fois dans le cours de son travail.

On a dit avec raison que la fréquence des maladies dues à l'occupation n'excède pas trois ou quatre pour cent du coût total de tous les accidents dans l'industrie. Nous croyons toutefois avec d'autres que ce chiffre ne dit pas toute la vérité. Il y a certes des conditions de travail qui ne provoquent pas d'incapacité mais qui détériorent graduellement la santé. D'autres peuvent produire une certaine incapacité tout en donnant naissance à des symptômes que l'on peut facilement attribuer à une maladie qui n'est pas due à l'occupation. Ce sont là des cas de maladies professionnelles méconnues et bien habile qui pourrait en apprécier le nombre.

Aussi le Ministère provincial de la Santé a cru devoir, comme on l'a fait d'ailleurs dans

d'autres pays, réglementer l'usage des produits toxiques utilisés dans l'industrie. Les poussières de silice et les poussières d'amiante auxquelles certains procédés de fabrication ou d'exploitation donnent naissance ont aussi fait l'objet d'une réglementation spéciale.

Cette réglementation aura pour effet non seulement de protéger la santé de nos ouvriers, de servir de guide à l'industrie, mais aussi de diminuer les charges financières considérables parfois qui retombent sur l'industrie par suite des réclamations de plus en plus nombreuses qui sont adressées à la Commission des Accidents du Travail.

La guerre actuelle évidemment a transformé bien des choses dans le monde industriel, particulièrement du point de vue des conditions dangereuses de travail. Un nombre considérable d'hommes et de femmes ont été employés dans les usines de guerre et ont dû venir en contact avec divers explosifs, tel que le T.N.T., le tétryle, le fulminate de mercure, la cordite, etc. Quelques-uns de ces explosifs sont nettement toxiques et la plupart sinon tous sont susceptibles de provoquer une dermatose. A cause du caractère explosif de ces substances, les méthodes ordinaires de ventilation ne peuvent être employées. Aussi, leur manipulation et l'élimination de leurs poussières et de leurs vapeurs dans l'air créent parfois des problèmes difficiles à résoudre.

La soudure électrique a aussi été utilisée sur une grande échelle durant cette guerre dans la construction des vaisseaux, dans la soudure de l'acier inoxydable, de l'aluminium et du magnésium, etc. On sait que la soudure à l'arc électrique est susceptible d'exposer les ouvriers aux vapeurs nitreuses qui sont très toxiques aux éblouissements (*eye flash*), et même à la fièvre métallique comme dans la soudure du fer galvanisé, qui donne naissance à des fumées de zinc. La guerre a nécessité l'utilisation de nouveaux solvants qui entrent dans la composition de certains ciments fabriqués avec les divers types de caoutchouc synthétique, que l'on a mis sur le marché. Il y a actuellement quelque 400 solvants différents utilisés présentement dans l'industrie. On a dit que tous les bons solvants sont toxiques. Voilà pourquoi il y a lieu d'être en alerte à chaque fois qu'un solvant est utilisé dans une usine. On devrait toujours s'informer de tous les ingrédients qui le composent, afin de rechercher s'il possède vraiment des propriétés toxiques. Le benzol est apparemment le plus toxique de tous. Le toluol

qui est un solvant moins toxique que le benzol avait remplacé celui-ci dans nombre d'industries. Mais durant la présente guerre, le gouvernement fédéral dû se réserver presque toute la production du toluol sur le marché pour la fabrication de l'explosif bien connu: le trinitrotoluol. Il en résulta pendant un certain temps une plus grande utilisation du benzol dans nos industries.

On a commencé d'utiliser aussi le cadmium. Les ouvriers qui font le placage au cadmium sont exposés à respirer des fumées de ce métal dont les effets sur l'organisme sont très toxiques. Ces fumées peuvent provoquer des symptômes d'empoisonnement, même à des concentrations relativement peu élevées. Un nombre assez considérable d'affections de la peau nous ont été rapportées parmi les ouvriers qui travaillent dans les usines où l'on fabrique des aéroplanes, où l'on manipule un alliage d'aluminium et de magnésium que l'on appelle le "Dural". Il semble toutefois que la majorité de ces dermatoses sont causées par le contact avec l'huile lourde de poisson (*heavy fish oil*) dont on enduit les feuilles de "dural" plutôt que par le contact avec l'alliage lui-même. Toutefois si des parcelles de dural s'introduisent sous la peau, il se produit de l'inflammation et par la suite de l'infection et des ulcères douloureux.

Avant la guerre, le matériel à souder plombifère était composé de 50% de plomb et 50% d'étain. Aux Etats-Unis, par suite de la rareté de l'étain durant le présent conflit, on s'est servi d'un matériel contenant presque 100% de plomb. Nous ne savons si la même situation a existé jusqu'ici dans notre province, mais c'est un fait que nos ouvriers viennent en contact plus fréquemment avec les poussières et les fumées de plomb, dans nos industries à en juger par les réclamations plus nombreuses qui sont faites à la Commission des Accidents du Travail. On peut ajouter que par suite de la guerre actuelle une masse plus considérable d'hommes et de femmes ont été exposés à des conditions de travail potentiellement plus ou moins dangereuses. Ces hommes et ces femmes par suite des heures supplémentaires de travail qu'ils eurent à fournir sont venus en contact pendant des périodes plus longues avec les diverses substances toxiques qu'ils avaient à manipuler ou qui chargeaient l'atmosphère des locaux de travail.

La guerre a provoqué l'utilisation de nouvelles substances chimiques et de nouveaux procédés.

Ces nouvelles méthodes de production ont constitué évidemment en certaines circonstances un danger additionnel pour les ouvriers concernés. Il arrive assez souvent que les propriétés des nouveaux composés chimiques utilisés ne sont pas bien connues. Récemment, des cas d'empoisonnement dont un mortel nous ont été rapportés à la suite de l'utilisation d'un composé toxique dans un établissement industriel. Les propriétés toxiques de ce produit étaient inconnues des autorités de la Compagnie qui naturellement n'eurent pas l'idée de prendre les mesures de protection qui s'imposaient.

Le béryllium est un des nouveaux métaux dont l'utilisation dans l'industrie est de date assez récente. On s'en sert pour la trempe du cuivre. On ne connaît encore rien de bien précis au sujet de la toxicité de ce métal.

Il est évident, en outre, que la guerre actuelle a augmenté les dangers d'accidents dans l'industrie, ajouté aux problèmes que pose le bruit excessif dans nos usines, et multiplié les facteurs qui exposent à la fatigue chronique.

L'importance des dangers auxquels la santé des ouvriers est exposée qu'ils soient causés par des agents physiques ou chimiques ne se discute plus. Les problèmes de médecine et d'hygiène industrielle qu'ils suscitent doivent être appréciés non seulement en fonction de la fréquence des maladies spécifiquement professionnelles, car une occupation dangereuse est loin de toujours donner naissance à une condition pathologique spécifique, mais aussi en fonction de l'aggravation d'une condition pathologique préexistante et d'une détérioration insidieuse et graduelle du niveau général de la santé chez l'ouvrier. Il ne faut pas perdre de vue que la plupart des intoxications professionnelles évoluent d'une façon chronique, qu'elles peuvent provoquer des symptômes communs à bien des maladies qui n'ont aucune relation avec l'occupation et qu'il est fréquemment impossible de déterminer si vraiment l'occupation a eu une part contributive dans certains cas de maladie chez l'ouvrier.

Toutes ces considérations suffisent à mettre en relief la nécessité pour l'industriel de prendre les mesures de prévention nécessaires sans lesquelles il ne pourra jamais éliminer ou réduire au minimum les dangers auxquels la santé de ses employés est exposée par suite de la nature des procédés qu'il utilise dans son établissement. L'examen médical périodique obligatoire pour tous les employés qui sont exposés à des condi-

tions de travail dangereuses ou suspectes constitue la première mesure préventive à adopter. Dans certains cas l'examen médical périodique s'imposera beaucoup plus souvent qu'une fois par année selon les conditions de travail et la nature du danger auxquels l'ouvrier est exposé.

Les substances toxiques dans les intoxications professionnelles sont absorbées la plupart du temps par les voies respiratoires, et la rapidité de la marche de la maladie, de même que sa gravité, dépendra de la concentration de la substance toxique qui charge l'air des locaux de travail et par conséquent de la quantité de cette substance que l'ouvrier aura absorbée. C'est là une des raisons pour laquelle tout médecin d'usine qui soupçonne l'existence d'une condition dangereuse de travail doit se prévaloir du service technique que le ministère provincial de la Santé met à la disposition de l'industrie dans le but de déterminer l'étendue et la nature du danger auquel l'ouvrier est exposé, de même que les moyens à prendre pour l'éliminer.

Assez souvent il est nécessaire pour le médecin d'usine de connaître tout d'abord l'étendue du danger et l'efficacité des mesures de protection, si on en a déjà prises, avant qu'il puisse décider combien fréquemment les ouvriers qui sont exposés à ce danger doivent être examinés.

Le fait que l'ouvrier a obtenu le privilège de se faire traiter par le médecin de son choix lorsqu'il est victime d'un accident au cours de son travail, ou lorsqu'il souffre d'une maladie professionnelle quelconque, et que le gouvernement provincial a mis sur pied une division de l'hygiène industrielle dont les services techniques sont à la disposition de l'industrie, a provoqué un intérêt presque universel en médecine et en hygiène industrielle.

Les médecins qui se destinent exclusivement à la médecine industrielle et ceux qui fournissent régulièrement une partie de leur temps à l'industrie deviennent plus nombreux. Même le médecin de famille aura de plus en plus l'opportunité de jouer un rôle en médecine industrielle et en hygiène industrielle.

Mais si l'on veut améliorer la santé des travailleurs et les protéger de façon efficace contre les dangers auxquels les expose leur occupation, il faut de toute nécessité qu'il y ait coopération étroite entre le médecin d'usine, le médecin de famille et les organismes officiels directement intéressés. Les efforts de la profession médicale pour promouvoir la santé du travailleur et son bien-être ne seront productifs qu'en autant que

le médecin d'usine, le médecin de famille, et l'hygiéniste industriel réaliseront complètement leur interdépendance dans ce domaine.

SUMMARY

An investigation has been made regarding health conditions of workers in various industries in the Province of Quebec. The inquiry included 3,384 industrial establishments employing 146,469 workers, and was directed towards the industrial risks of the work. Such conditions as dust, noise, temperature were classified according to their degree. Noise was found to be a very common condition, sometimes to a very high degree. Over 22,000 workers were exposed to excessive noise in their work, of whom 10,000 were in the textile industry and more than 3,000 workers were exposed to excessive heat. Dust of course is one of the most important industrial hazards, silica and asbestos being the chief offenders. More than 6,000 workers were found to be exposed to dust hazards and probably this is well below the actual number. Ventilation is the chief method of protection.

Industrial dermatitis is another difficult problem. About 75% of claims on the Workmen's Compensation Commission of Quebec are based on industrial dermatitis. More than 16,000 workers were found to be exposed to various irritants in their work. Specially important poisonous substances were lead, benzol and mercury.

It is felt that the amount of illness due to occupation is greater than what it is generally supposed to be, especially if one considers the conditions which bring about ill health gradually.

The paper deals with a very varied list of occupational hazards, including some of munition plants, and should be read in its entirety. It concludes with an appeal for co-operation between the doctor in the plant, the family physician and the management.

IMMUNIZATION AGAINST PERTUSSIS WITH ENDOTOXOID VACCINE *

By T. C. Brereton, M.D.

Winnipeg

IN 1914 the Council on Pharmacy and Chemistry of the American Medical Association admitted pertussis vaccines to *New and Unofficial Remedies* on the basis of what appeared at that time to be acceptable clinical evidence.¹ Subsequent reports following carefully controlled field studies over a period of fifteen years indicated that the results were not satisfactory. As a result, in 1931,² the Council recommended that these vaccines be entirely omitted from *New and Unofficial Remedies*. Of interest is the almost simultaneous report of Leslie and Gardner³ describing the four phases of *H. pertussis* indicating that phase I is found in the active stages of pertussis while the other phases were produced by laboratory sub-culture

* Prepared by Ayerst, McKenna & Harrison, Ltd., Montreal, and Rouses Point, N.Y.

under various conditions, some of which were deleterious to maintenance of phase I.

Since 1933 a number of significant reports on the use of pertussis vaccines have appeared in the literature (Sauer,⁴ Kendrick,⁵ Kramer,⁶ Singer-Brooks,⁷ Miller,⁸ Perkins,⁹ Dougherty-Denmark¹⁰) but detailed analysis seems to indicate that vaccination resulted in only 60% reduction in the risk of being attacked, or a 40% failure.

In view of the fact that the failure noted in immunization with pertussis vaccines was higher than that experienced with other immunizing agents such as diphtheria toxoid, tetanus toxoid, etc., it was deemed advisable to study over a period of 2½ years the immunizing quality of pertussis endotoxoid vaccine as described by Strean.^{11 to 15} This pertussis immunizing agent combines the antigenic qualities of phase I bacterial substance and the endotoxin.

The present report is limited to the active immunization of 436 pre-school children in a private practice. The age distribution was from 4 months to 5 years. Each child received 4 injections at 14 days' interval, according to the following dosage: 1.0 c.c., 1.5 c.c., 1.5 c.c., and 2 c.c., that is, a total volume of 6 c.c. representing 90 billion phase I *H. pertussis* organisms and 900 units of pertussis endotoxoid. The local reactions varied; some had no reactions while others were mild and moderate. In some instances the children had some malaise for a day or two following injections but in no case were the reactions serious.

TABLE I.
RESULTS OF IMMUNIZATION WITH
PERTUSSIS ENDOTOXOID VACCINE

No. of children immunized	Age distribution	Pertussis following immunization
264.....	4 months	0
33.....	5 "	0
48.....	6 "	0
10.....	7 "	0
12.....	8 "	0
5.....	9 "	0
4.....	10 "	0
2.....	11 "	0
9.....	12 "	0
3.....	13 "	0
3.....	14 "	0
4.....	15 "	0
2.....	16 "	0
6.....	18 "	0
10.....	2 years	0
11.....	3 "	0
7.....	4 "	0
2.....	5 "	0
1.....	6 "	0

REACTIONS

Reactions following the injection of the vaccine were mostly of a mild character. Some children showed a moderate reaction while in a few instances the effect may be described as severe. The various reactions are described as follows:

(a) *Mild*.—Most infants show no local redness or swelling at the site of injection but for twenty-four hours following inoculation the child is cross and fretful. There is no temperature rise and the child responds to aspirin (1¼ gr.)

(b) *Moderate*.—Locally the arm will show some swelling and a mild redness ½ inch in diameter at site of injection. There may be a slight temperature rise for about 2 days. A slight indurated area may persist for some weeks.

(c) *Severe*.—Reactions of a really severe nature were never observed. However, in one or two instances the indurated area at the site of injection softened and ruptured. The temperature rose to 102 to 103° for a day or two.

DISCUSSION

It is interesting to note that of a total of 436 children immunized with pertussis endotoxoid vaccine, not one child developed pertussis in a period of 2½ years. In the city of Winnipeg over a similar period there were 1,171 cases of pertussis. The total population of the city was 221,960. Included in this population were about 20,000 children up to the age of 6 years. On this basis 5.8% children out of every hundred under the age of 7 years came down with pertussis.

The incidence of pertussis in Winnipeg covers all ages and therefore the figure is much smaller than what might be expected in a selected group of young infants and children up to the age of 6 years.

It appears that the determining factor in this clinical trial was the double-barrelled immunity which resulted from the injection of bacterial antigen and endotoxoid; by the one antibacterial immunity was produced, and by the other antiendotoxic. Supporting this view is the Report of the Council of Pharmacy and Chemistry of the American Medical Association¹⁶ which states that pertussis vaccines in the past have been only 60% effective.

While the number of children studied represents a comparatively small group, neverthe-

less, it is significant because they form a cross-section of a community where pertussis may be expected to occur and none was found in the immunized group. Moreover, in the years prior to the initiation of this study, pertussis was found in children immunized with other forms of pertussis vaccines.

The local reactions, most of them mild, were due to the preservative (sodium ethylmercurithiosalicylate) which is more irritating than phenol, and the potency of the injected material. The number of injections (4), the interval between injections (2 weeks), the nature and unitage of the antigens in all probability accounted for the high degree of immunity produced in these children.

SUMMARY AND CONCLUSIONS

1. Pertussis endotoxoid vaccine was injected into 436 pre-school children and in a period of $2\frac{1}{2}$ years none developed pertussis. Ordinarily following injections of other pertussis vaccines, one might have expected an incidence of about 40%.
2. Immunity against the living organism and its endotoxin is superior to either one alone.
3. A four-dose schedule at 14 days' interval appears to impart a high degree of immunity.
4. While local reactions are found they are for the most part mild in nature.

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Medical Arts Building

RÉSUMÉ

436 enfants d'âge préscolaire furent vaccinés contre la coqueluche avec l'endotoxine. Dans les $2\frac{1}{2}$ ans qui suivirent aucun d'entre eux n'eut la maladie. Habituellement, après l'injection d'autres vaccins anti-coquelucheux la maladie survenait quand même chez 40% des sujets. Le vaccin préparé avec l'*H. Pertussis* et son endotoxine est supérieur au vaccin préparé isolément avec l'un ou l'autre des ces éléments. L'immunité maxima est acquise après une série de 4 injections à 14 jours d'intervalle. Les réactions locales, lorsqu'elles se présentent, sont minimes.

JEAN SAUCIER

MATERNAL AND FETAL ANOXIA

By Edwin M. Robertson, M.B., Ch.B.,
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ARTIFICIAL RESUSCITATION

THE apnoeic baby presents one of the most urgent situations the obstetrician has to face. What must be done? The baby should be held in the head-down position while the amniotic fluid, mucus and blood are sucked from its throat and stomach. The cord is not cut for five minutes after birth. The mother is made to breathe oxygen through a closed mask. A bent-wire airway is passed behind the baby's tongue and oxygen is administered from a mechanical resuscitator. If the resuscitator is not effective within two minutes, a tracheal catheter is introduced and, after extraction by suction of mucus or amniotic fluid from the trachea, oxygen is intermittently forced into the lungs under low controlled pressure. A Torpin control valve¹ regulates the pressure of oxygen. If the baby remains flaccid, exhibiting no signs of spontaneous movement and respiration, oxygen and carbon dioxide mixture takes the place of pure oxygen. A switch from the mixture to oxygen alone should be made frequently. When spontaneous respiration commences, the throat and stomach should be, once more, emptied by suction.

CUTTING THE CORD

The cord is not cut until it is apparent that the placenta is separating or until five minutes have elapsed from the time of the birth of the baby. During that time, with the cord intact, the baby receives fifty to one hundred c.c. of blood squeezed from the placental inter-

¹ Read at the Seventy-sixth Annual Meeting of the Canadian Medical Association, Section of Obstetrics and Gynecology, Montreal, June 13, 1945.

spaces.² If ergometrine has been injected intramuscularly just after the birth of the baby's head, the uterus will contract strongly in about five minutes from the time of injection and force the placental blood toward the baby, increasing the total oxygen carrying capacity of the baby's blood thereby.

OXYGEN

Inhalation of oxygen to the point of supersaturation will increase the oxygen content of the mother's blood 10 to 15%³ and there will be a distinct gain for the fetus through the placental circulation. If inhalation therapy is used to combat intra-uterine asphyxia, a slow fetal heart will speed up and after birth, in the case of an apnoëic baby, if the cord is not cut immediately, a "blue" baby will be seen to turn a healthy pink. When the maternal circulation and muscle tone are depressed under analgesic or anæsthetic agents, inhalation of high concentrations of oxygen increases the oxygen content of the blood to a relatively greater amount than in the wide-awake healthy person.

Oxygen is administered to the baby because it is the "breath of life". Obviously, the brain and the heart, blood vessels and lung tissues require oxygen and so, also, do such apparently insignificant structures as the cells and cilia lining the bronchi and trachea so that they may keep the bronchial passages clear.

CARBON DIOXIDE

Carbon dioxide gas is a specific factor in maintaining muscle tone and in promoting respiratory movements. It has been conclusively demonstrated that in asphyxia neonatorum, sampling of blood reveals a raised carbon dioxide tension. It would seem from the biochemical studies of Eastman⁴ and Eastman and Kreiselman⁵ that administration of carbon dioxide is unnecessary to revive an apnoëic baby already apparently overloaded with the gas, and nowadays many obstetricians no longer use carbon dioxide or oxygen and carbon dioxide mixtures in resuscitation. Yandell Henderson⁶ strongly advocated using carbon dioxide, for two reasons. He believed that the nerve centre controlling muscle tone requires oxygen and carbon dioxide to maintain its activity and he also held that the respiratory centre, dulled by analgesic drugs, especially morphine and the barbiturates, requires a high concentration of

carbon dioxide to stimulate its function. Windle,⁷ in his guinea pig asphyxia experiments, showed that recovery was much faster when carbon dioxide and oxygen mixture was used than when oxygen alone was administered. At the moment, I am still inclined to advocate the use of carbon dioxide and oxygen in resuscitation of apnoëic babies.

NITROGEN

It has been suggested that, at intervals, nitrogen should be blown into the lungs under limited pressure, to supply a gas which will maintain the distension of the alveoli when, as may happen, oxygen may be completely absorbed. This can be done by the attendant gently blowing through the Torpin valve to the intra-tracheal catheter.

POSITIVE PRESSURE

The positive pressure used in administration of these various gases to distend the chest intermittently by itself stimulates respiratory movements.

The premature baby is more commonly the subject of asphyxia neonatorum than the full-term baby and in these small babies it is very difficult to intubate through the mouth. Often, attempts to administer oxygen or oxygen and carbon dioxide mixture merely result in gas being blown into the stomach. Therefore, great care must be taken to pass the tracheal catheter into the trachea.

DRUGS

Alpha lobeline may be injected into the fetal blood stream by way of the umbilical vein and in many cases, where muscle tone is good, respiratory movements will be initiated. It is doubtful if this drug, or, indeed, any other such drug, will effect a respiratory response if the general muscular system is flaccid or if, as Eastman⁵ has reported, the baby is anoxic. When all methods of resuscitation have failed and it appears that the heart is also about to stop, epinephrin is injected into the left ventricle. A grave risk of intracardiac injection is the production of hæmopericardium.

HEAT

The baby should not be specially heated for several reasons. The apnoëic baby is in a state of shock with flaccid muscles which fail to boost the blood back to the right heart. The low blood pressure leads to cerebral anæmia and anæmia

of other important organs. Heating the baby's skin tends to dilate the skin vessels and redirect blood to parts not essential to the immediate needs of the baby. Heat, too, increases metabolic use of oxygen which, in the circumstances, is most undesirable. The once common procedure of placing the baby in a hot water bath entails raising the baby's head above the level of the chest and such a manoeuvre prevents escape of fluid from the bronchi and trachea. The head-low posture, however, encourages drainage from the chest and increases the return of blood to the right heart.

AFTER-CARE

If, after spontaneous respiration is established, the movements are laboured, with heaving of the chest wall and indrawing of the epigastrium, accompanied by an expiratory grunt, it is almost certain that there is an obstruction in some part of the bronchial tree, non-expansion of lung tissue, pneumothorax or, perhaps, pneumonia. An x-ray plate of the chest will aid diagnosis and if an obstruction is suspected, further aspiration of the trachea and bronchi through a fine catheter inserted under direct vision, may save a life.

The after-care of a once-apnoeic baby calls for constant nursing care for the first twenty-four hours, because apnoeic attacks may occur or, less severe, attacks of distressed breathing due to blocking of a bronchus and accompanying lung collapse. The baby should be nursed for at least twenty-four hours in an incubator in which a high concentration of oxygen can be maintained.

HYPOXIA AND ANOXIA

The commonest cause of fetal death is asphyxia, due to hypoxia or anoxia. It rarely occurs in the non-complicated labour of healthy women. Anæmia, toxæmia, antepartum hæmorrhage, uterine inertia, mechanically difficult labour are, of themselves, or by their unsuccessful treatment, the major complications of pregnancy and labour in which, incidentally, the mother suffers hypoxia or anoxia or the fetus becomes hypoxic or anoxic.

If the baby survives hypoxia or anoxia it may suffer severe neurological after-effects. It may be a child that dies on the tenth day; it may be a weakly and unhealthy child presenting the parents and doctor with many behaviour or health problems or it may grow

to be one of those unfortunate adults whom we speak of as suffering from constitutional inadequacy. Schreiber⁸ and others have given us their clinical evidence and, especially, Windle⁷ has supplied the experimental evidence proving that fetal asphyxia may be followed by cerebral damage. A description of what occurs during anoxia should be one of the most important lessons in obstetrics and impressed deeply on the mind of every student and practitioner.

PATHOLOGY

Vascular congestion, escape of plasma and blood cells into the tissues and, finally, cell and massive tissue necroses are the effects of anoxia in their sequence of occurrence.

The vascular congestion slows the circulation. Oedema of the brain causes intracranial tension, and fluid escaping into the alveolar walls of the lung produces turgidity and inelasticity of the very tissues which depend on free movement for their proper function.

Anæmia of the blood vessels leads to bleeding into the tissues which may be a mere diapedesis or a large hæmorrhage. Where surrounding parenchyma is soft, as in the brain, small and large hæmorrhages take place. Sometimes blood fills the ventricles. No tissue of the body escapes damage.

Necrosis is the sequel to oedema, increased localized areas of pressure and bleeding, but cell damage begins with oxygen want. Nerve cells are especially susceptible to oxygen deprivation. Probably the brain shows more extensive damage than other tissues because the respiratory quotient of nerve cells is very high.

Fluid in the lungs may be in part due to anoxia oedema but it is also caused by intra-uterine inspiration of amniotic fluid. The fetus, *in utero*, probably does not perform full respiratory movements except when subjected to intra-uterine asphyxia and therefore it is in those babies which have been so disturbed that there is added to this distress a sort of drowning process.

Relatively speaking, only a few competent observers, mostly neurologists and pædiatricians, have published follow-up reports on the development of children asphyxiated at birth. Few obstetricians have complete records of the childhood or adult life of many of their earlier

charges. However, from available publications it can be definitely stated that anoxia at birth may cause permanent brain damage as evinced in problem children and others of low mental status.

EXPERIMENTAL ASPHYXIA

Windle,⁷ using guinea-pigs, produced anoxia and asphyxia at birth. The baby pigs were resuscitated more quickly with oxygen and carbon dioxide mixtures than with oxygen alone. He noticed that stimulants did not produce any respiratory response until, under rhythmic distension of the lungs with oxygen and carbon dioxide, the general tone of the muscular system of the whole body returned. The pigs lost weight and many died. Those that survived gained weight only slowly and were very difficult to rear. Neural damage was exhibited in weakness and sub-normal reflexes, paralysis, convulsions, hypoaesthesia, somnolence and impaired vision and hearing. Their behaviour was docile and learning power was weak. Reactions were slow and stereotyped and there was a lack of plasticity in all responses. Section of the brains of these pigs showed widespread neural damage.

There is no doubt but that Windle's vivid demonstration of the grave results of asphyxia neonatorum reflects fairly the consequences of asphyxia neonatorum in the human baby.

CONCLUSION

The most important methods of reducing the fetal and neonatal death rate lie in increasing our efforts to improve undergraduate teaching and promote revision teaching of postgraduates; improvement of equipment in labour rooms and nurseries; extending laboratory and diagnostic facilities to all doctors; popularizing the invariable use of x-ray examination of the pelvis and the fetus; the more frequent use of blood transfusions and nutritive infusions; the constant use of inhalation therapy during long or difficult labour and during the immediate neonatal phase of the baby's life; and the more frequent use of some form of regional anaesthesia.

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CONTINUOUS SPINAL OR LUMBAR ANÆSTHESIA*

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THE DISCOVERY OF AND EXPERIMENTAL WORK WITH COCAINE

THE discovery by Niemann in 1859, over eighty years ago, of the alkaloid of cocoa leaves, to which the name cocaine was given, may be said to mark the first episode in the history of spinal analgesia. Schraff in 1862 discovered the local analgesic properties of this substance. With the application of the latter discovery in surgical procedures, suggested by Koller in 1884, spinal analgesia was fairly launched.

Following immediately upon this work experiments were undertaken by workers throughout Europe and America, all having in view the production of local analgesia for surgical purposes. Corning's brilliant work on the prolongation of analgesic effects of cocaine administered subcutaneously was the logical antecedent to his equally brilliant experiments with local medication to the cord. He stated:

"There can be no doubt, especially if the injection be made between the second and third lumbar vertebrae, that the functions of the lower segments of the cord itself may be powerfully affected in this manner. We have only to conceive of the cerebrospinal fluid being at this point thoroughly impregnated with the medicinal fluid and lying in direct contact with the pia . . . to be convinced of the potency of such a procedure."

The dangers involved in such an operation were considered by Corning, and his own observations were in accord with those of others.

APPLICATION OF THE ANALGESIC EFFECTS OF COCAINE UPON THE CORD TO SURGICAL OPERATIONS BELOW THE DIAPHRAGM

The studies of Corning seemed to have made little or no impression until Bier demonstrated their entire feasibility. With the publication of his work the surgical application of spinal analgesia was definitely established. Tait and Caglier and Matas divide the honours for having performed true spinal anaesthesia in North America in 1899. The development of spinal anaesthesia was made popular by Tuffier of

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France, and soon literature on the subject became extensive. It was not long before Bier felt called upon to protest against the recklessness with which the method was being employed, regardless of the fact that no noteworthy improvement in technique had been evolved. He protested especially against the dangerously large doses of cocaine which some operators used. New methods, he insisted, should be devised in an attempt to reduce the toxicity of the drug and to prevent the unpleasant side effects so often noted.

In the early stages of the surgical application of spinal analgesia Gwathmey began to employ this method, being particularly interested at the time in its use in young children, the youngest being two and a half years and the oldest eleven years of age.

THE APPLICATION OF SPINAL ANALGESIA TO PARTS OF THE BODY ABOVE THE DIAPHRAGM

It is impossible in such a short paper to follow the work of the large number of surgeons who have devoted attention to the subject. Tait and Cagliere in 1900 reported three cases in which cocaine was injected into the sixth cervical interspace without untoward effects. Morton in 1900 also presaged the recent extension of spinal analgesia to surgical operations upon all parts of the body. He said:

"I think we will soon find that by injecting higher into the dorsal region, anæsthesia can be extended all over the body with perfect safety. It has been demonstrated by making the injection into the upper part of the dorsal region of the dog. It does not interfere with motion, consciousness or sense of touch."

In a later communication he stated:

"I think we have a safe and reliable analgesic in the subarachnoid injection of cocaine for the performance of operations on parts of the body above the diaphragm under spinal analgesia."

It appears that the work of Tait, Cagliere, Morton, Chaput and others with high injection was not followed up with further publications, for which reason perhaps, originality in this regard has been accorded generally to Jonnesco about 1908. Jonnesco believed that the respiratory nerves are not involved in high injections, although all the other nerves of that spinal region are paralyzed, because of the influence of strychnine. In the addition of strychnine to the analgesic solution Jonnesco was evidently original.

Within the next few years the dangers of total analgesia with concentrated cocaine were realized, and the use of spinal analgesia as a total analgesia was given up, save for the occasional use of Le Filliatre's method. In 1920 Delmas published his technique, one in which forcible injection was a definite factor. In and around 1928 the method was again revived and revised by Koster and Vehrs, Koster by moderate dosage with barbotage, and Vehrs by dilution of anæsthetic agent. At this time cocaine was supplanted by procaine. Maxon believed it too perilous for deliberate use, save in most unusual circumstances. Certainly complete familiarity with spinal analgesia for operations below the diaphragm must be acquired before one could venture on its use for operations on the head, neck and thorax. Babcock warns against its use. Despite this a few well qualified experimenters are finding a safe method for its production.

At the present time procaine, pontocaine and percaine or nupercaine are the drugs of choice, while metycaine is used by some. Each has advantages and disadvantages. One must remember that in the prolongation of anæsthesia by the single injection technique there is more potential danger. The choice of drug is important, but the manner in which it is employed is more important. In other words let us use the technique with which we are most familiar. Maxon has pointed out that cocaine used skilfully is safer than procaine used carelessly. For procaine we might substitute pontocaine and percaine, and his statement would still be correct.

CONTINUOUS LUMBAR OR SPINAL ANÆSTHESIA

Early in 1939, William T. Lemmon, of Philadelphia, recognizing the shortcomings of the single injection technique, in its failure to produce anæsthesia of sufficient duration for the operative procedure, described a new technique of continuous spinal anæsthesia with fractional dosage. His method was the result of observations on animal experimentation at Jefferson Medical College. After satisfying himself on its feasibility and safety, he carried his technique into the operating room. After five hundred administrations he described for the first time "A method of continuous spinal anæsthesia".¹ This technique was not accepted at once (1940), and in some places it is not viewed with favour today. The originator and others^{4, 5}

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have continued to use it and from time to time publish their reports. Today its success is reported in medical literature from many clinics and teaching centres in the United States and to a lesser extent in Canada and abroad. Lemmon's latest reports³ consist of observations in over two thousand cases with no anæsthetic mortality. Our experiences began early in 1941, after a visit to the clinic in Philadelphia, and at present our series stands at over sixteen hundred cases of personal administration, with no anæsthetic mortality.

Our method⁴ varies somewhat from the original described by Lemmon, in that he uses a concentrated solution of procaine, and we use a dilute solution. It has been pointed out that the toxicity of procaine increases in geometric proportion to the concentration. We believe this to be true not only for procaine but all local agents, and we feel that they should be used in the weakest effective solution. Another advantage of procaine is its fleeting action in contrast with pontocaine and percaine. This property alone, especially when high anæsthesia is employed, is worthy of consideration.

The technique of continuous lumbar anæsthesia consists of making and maintaining a successful lumbar puncture, and the administration by repeated injection of anæsthetic solution in sufficient concentration to maintain surgical anæsthesia. For this we will describe techniques for the more commonly used solutions, procaine, pontocaine, and percaine, either singly or combined. All the nerves of the body without exception traverse the subarachnoid space and are easily blocked by intrathecal injection. Fractional dosage technique is easy to learn, and with ordinary precautions is safe. It should be and is safer than the predetermined dosage single injection technique. With continuous technique one can produce anæsthesia for any duration. We must always have a free communication with the cerebrospinal fluid.

The procedure begins with the examination of the patient in order to enable one to grade the anæsthetic risk, and also to make sure there are no contraindications. It affords an opportunity of ensuring proper preoperative medication which we feel should be commenced the night before operation.

For the middle-aged patient we consider the following to be proper medication; the night before operation nembutal gr. 3: the following morning two hours before operation, nembutal

gr. 3; one hour before operation by hypodermic injection morphine sulphate gr. $\frac{1}{4}$, with scopolamine gr. $\frac{1}{150}$. Patients should be in the state of analgesia even to the point of being asleep. There is no apprehension or argument, and persuasion is unnecessary.

During operation, morphine sulphate gr. $\frac{1}{8}$ intravenously or demerol 50 mgm. may be given for sedation. We do not hesitate to use intravenous pentothal sodium, in dilution of 1 in 100 to 1 in 1,000 by continuous drip to maintain sedation, to prevent nausea and vomiting, and to protect against toxicity of the anæsthetic agent employed. Intravenous fluids and oxygen are useful at times. The use of pressor drugs is still open to question, but the fact remains that it is wise to maintain an arbitrary level of pulse pressure, especially in the arteriosclerotic or hypertensive patient. This may be accomplished in most instances by various agents, such as ephedrine, neo-synephrin hydrochloride, adrenaline, ephedrine-pitressin combined, or methedrine. Pressor drugs may be given by single or repeated injection subcutaneously or intravenously, or in dilute solutions by continuous drip.⁶

Equipment for continuous lumbar anæsthesia.—In order to administer successfully continuous lumbar anæsthesia, special equipment is necessary. This consists of a sectional mattress; malleable needles; about thirty inches of small-calibre, thick walled rubber tubing, to which is attached a Luer-lok connection for attachment to the spinal needle; and a stop-cock which is attached to a 10 or 20 c.c. Luer-lok syringe. The accessories are a Sise or Moore introducer and a Luer-lok plug.

The mattress is about five inches thick, and is rubber covered. It is made up in two sections, which conform to the size of the average operating room table. The upper section accommodates the trunk of the body, while the lower section takes care of the lower extremities, the two sections being detachable. The upper section has a cut-out portion to accommodate the needle in the lumbar spine while the patient is in the supine position. The break between the two sections of the mattress allows the lower section to be removed for perineal operations and to be replaced after pulling the patient and mattress to the head end of the operating table. The mattress in this position is held in place by straps and buckles attached to the table.

Malleable spinal needles are available in three sizes, Nos. 17, 18 and 19 gauge, in varying lengths of 3, $3\frac{1}{2}$, and 4 inches. We prefer the No. 18 gauge, $3\frac{1}{2}$ inches long for the majority of cases. The needle is attached to the stop-cock assembly, and this in turn is attached to the 10 or 20 c.c. syringe.

Special consideration on technique.—The technique of administration is simple. For the puncture the patient is placed in the lateral decubitus position, with the back arched toward the cut out portion of the mattress. The rules of asepsis must be rigidly observed at all times.

The site of puncture is the interspace at the intercostal line, because it is usually the most easily punctured and it is below the termination of the spinal cord. The skin is prepared with alcohol and

draped with the spinal sheet. The intradermal wheal is made and this can be made painlessly if the bevel of the needle is held against the skin and firm pressure commenced while the needle is advanced slowly into the skin. For the skin wheal it is advantageous to use procaine without adrenaline. One per cent solution is sufficient and more than 2% is never necessary. After local infiltration the skin is punctured with the Sise introducer. It has been pointed out by Lemmon³ that it is better not to puncture the intraspinal ligament, for it is the firm grip of the ligament on the needle that helps to maintain the needle in position during anaesthesia.

The puncture is made with the fine gauge needle in the following manner: The needle is grasped between the thumb and forefinger about one inch from its tip and the puncture is commenced, perpendicular to the back or inclined slightly upward. The larger malleable needles may be used as an ordinary spinal puncture needle, by directing them from the hub. We use the midline approach as judged by palpation of the spinal column, and midway between the lumbar spines. Once the needle has punctured the intraspinal ligament it is impossible to change its direction.

Now that the puncture is made, we are ready for the initial injection, and this is usually three-quarters of the estimated dosage of the single injection technique. The stop-cock assembly, with syringe attached is filled with anaesthetic solution, and connected with the spinal needle. The initial dose is now injected and the patient is postured for operation. After posturing it is well to test the continuity of the cerebrospinal flow, and later the height of anaesthesia. If continuity is lost readjustment of the needle is necessary, and this can be done through the cut out portion of the upper section of the mattress. If the desired height of anaesthesia is not attained the use of gravity and/or the administration of more anaesthetic solution is necessary.

PROCAINE TECHNIQUE

In all cases of procaine administration the same technique is followed. After the puncture has been made, the 10 c.c. of spinal fluid withdrawn is used to dissolve 500 mgm. of procaine hydrochloride. The stop-cock assembly is attached to the syringe; 2 c.c. are forced into the tubing (displacing the air), filling the tubing with a 5% solution of procaine in spinal fluid. Now the tubing is attached to the spinal needle and the initial injection is made. The dose varies, but usually is 3 c.c. or 150 mgm. of procaine. After the injection is made testing for continuity of fluid is done. The stop-cock is then closed and the patient is turned on his back, or placed in position for operation. The needle should not touch the mattress or the operating table. Once satisfactory anaesthesia has been established, it may be maintained by subsequent injections of 1 c.c. or 50 mgm. every thirty minutes.³

Our technique⁴ varies from that of Lemmon's in that we use a 1% solution of procaine in saline. It is used as a filling type technique in which no barbotage is used. The initial dosage is as follows:

Maternity cases	5 to 6 c.c.
Plastic vaginal	8 to 10 c.c.
Hernias	10 to 12 c.c.
Lower abdominal	12 to 15 c.c.
Upper abdominal	15 to 18 c.c.

These are followed up with subsequent injections of 3 to 5 c.c. every fifteen to thirty minutes, or as required to maintain surgical anaesthesia. With the dilute solution, the Trendelenburg position plus the volume of solution injected are the factors governing height of anaesthesia. The use of a solution of known strength seems to me to be a more scientific procedure. Predictions are more constant than when solutions of unknown strength are employed, such as we have after barbotage.

Much can be said for procaine. It is the shortest acting of all the local agents. Procaine in dilution especially in upper abdominal surgery is safer than concentrated solutions. With dilute solution technique, the effects upon the vasomotor, cardiac and respiratory systems, are not so profound, and this results in added safety in upper abdominal and chest surgery. Dilute solutions are a safeguard against respiratory paralysis, or atelectasis with spinal anaesthesia. It has been shown that spinal anaesthesia with concentrated solutions is the offender in these respects.⁷

Pontocaine glucose technique.—For this we use pontocaine 20 mgm., 3 c.c. dextrose 10%, and distilled water to 10 c.c., for intra-abdominal work, and for extra-abdominal work we have a total volume of 20 c.c. The 10 c.c. solution yields a 0.2% solution while the 20 c.c. volume gives a 0.1% solution.

The patient is placed in the lateral decubitus position for the injection and immediately after placed in the supine position with 5 to 10 degrees of Trendelenburg. No barbotage is used. The initial dose is 10 to 12 mgm. of pontocaine. The initial dosage is followed up with subsequent injections as required. The Trendelenburg position is maintained until anaesthesia is slightly lower than the desired level. The table is then levelled off and a pillow is placed under the shoulders and head, to elevate the upper thoracic and cervical segments. With this technique anaesthesia is more profound, and the time between subsequent doses is lengthened, as compared with procaine technique.

Pontocaine glucose procaine technique.—This technique is the same as the above with the exception that a 1% procaine solution in saline

is used instead of distilled water. We have employed it in over 300 cases with success.

Procaine nupercaine technique.—In this technique we employ two dilute solutions, procaine 1% in saline, and nupercaine 1:1,500 dilution. For the puncture the patient is placed in the lateral decubitus position, and is given the initial injection of 12 to 18 c.c. of dilute procaine. Immediately after this the patient is placed on his back with the head of the table slightly lower than the foot. This solution being heavier than spinal fluid soaks the posterior roots more than the anterior ones and we get for the most part relief of pain, with moderate muscular relaxation. If further muscular relaxation is required the second injection is carried out with nupercaine dilute, and for this 8 to 10 c.c. is given, with a further lowering of the head of the table. This second injection soaks the anterior or motor roots. This technique is especially useful where Trendelenburg position is required by the surgeon.

Value of dilution technique.—For the past five years we have used dilution technique entirely, with volume and dilution control, together with the intermittent dosage technique of Lemmon. We have been able to give satisfactory anaesthesia by this method and can see no *bona fide* reason why we should use the concentrated technique, which, in our opinion, is both unnecessary and dangerous. It has been noted that the dilute technique gives anaesthesia for almost as long a period as comparable doses of concentrated solutions, without the unpleasant side effects. With the continuous technique drugs which act for long periods are not required.

Some anaesthetists reserve the continuous technique for long operations such as gastric resections, biliary tract operations, bowel resections, certain orthopaedic procedures, and perineal prostatectomies. We use it for all of these, and in operations of lesser magnitude as well because of the additional safety factor it affords. In so doing we employ solutions in dilution, rather than depend on increased dosage and concentration for duration of anaesthesia.

Advantages and disadvantages.—The main advantage of the continuous technique for lumbar anaesthesia in our opinion is its safety factor. It also is capable of producing anaesthesia for any given length of time. Solutions of dilution may be used in contrast to concentration and increased dosage. The main disadvantage

is mastering a new technique. Lumbar puncture with the malleable needle is more difficult, and to some this is a mental hazard. The equipment, with use, tends to develop leaks, and old equipment must be replaced. In spite of these minor disadvantages, we believe the technique is well worth mastering, since it pays dividends in added safety and time precision in anaesthesia.

TREATMENT DURING OPERATION

It has been pointed out that in certain instances it is the surgery and not the anaesthesia that causes the excessive fall in blood pressure.³ Nevertheless as anaesthetists we must prevent damage to the respiratory, cardiac and vaso-motor systems. The respiratory system is protected by avoiding intercostal and phrenic nerve block to such a degree as to cause serious embarrassment. This is assured by proper dosage and posturing of the patient, to prevent cephalad extension of the anaesthetic solution. The use of oxygen is invaluable.

The same precautions are used to prevent cardiac embarrassment, that is preventing block of the cardio-augmentory fibres. It must be remembered that in upper abdominal surgery there is a slowing of the pulse with a fall in blood pressure. In the progressive upward block there is an interference with the white rami, and innervation of the adrenal glands, which gives a further fall in blood pressure. To prevent an undue fall in blood pressure many give a routine injection of ephedrine, or other vaso-pressor drug. We do not use a vaso-pressor drug routinely, but are firm believers in the use of intravenous fluids and oxygen therapy. We think that hypertensive drugs are useful in certain cases, such as hypertension, since a sustained lowering of the pressure in these cases may be the forerunner of cardio-vascular renal disaster.

For the prevention of surgical shock, we use intravenous therapy in the form of glucose, blood or plasma. This also provides an avenue by which to administer sedatives such as morphine, demerol, or pentothal sodium. The pentothal is used in dilutions of 2½ to 1/10%. At present we are using vaso-pressor drugs in dilution as recommended by Evans⁸ to maintain blood pressures and have found this method to be very satisfactory. Besides this we have used in dilution ephedrine, ephedrine-pitressin, neosynephrine, and methedrine, all with good results.

SUMMARY

1. The history of spinal or lumbar anaesthesia is outlined.

2. The original continuous spinal technique is given, as well as the present conception of dilute solution techniques with various solutions.

3. The special equipment is described in detail, without which it is impossible to administer consistently successful continuous lumbar anaesthesia with intermittent dosage technique.

4. Low dilution techniques with procaine, pontocaine glucose, and procaine-nupercaine are described.

5. Preoperative, operative, and postoperative care is described, with special reference to the prevention of shock, and the maintenance of blood pressure by the continuous drip of dilute analeptics.

6. A five-year period of the use of dilute solution technique is evaluated, with special reference to quality of anaesthesia and safety.

The 1% procaine hydrochloride mentioned in this paper was supplied by the Synthetic Drug Co. of Toronto, Ont.

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TOWARD A LOWER MORTALITY IN APPENDICITIS

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and

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WHEN Fitz, in 1886, recognized appendicitis, and described it as a clinical entity, he took the first step in combating a surgical disease which must have been one of the greatest killers of youth.

Steadily, through the past sixty years, the mortality of appendicitis has been whittled down. The increased accuracy of the clinical diagnosis; the appreciation of the emergency operation; the realization that in late general

peritonitis from appendicitis operation can only do harm; the great developments in postoperative care; and, finally, the advances in chemotherapy and parenteral feedings—all these have enfeebled the killer. Today it can be said that in the ideal community, with a fair level of intelligence among its inhabitants, and adequate medical care, the mortality of appendicitis should be zero.

In 1941, (*Canad. M. A. J.*, 45: 430) we studied the statistical evidence based on 250 consecutive appendectomies performed by one of us (A.L.M.) In our present study of the second 250 cases, we find no gross changes in diagnostic groupings, in case histories, in physical and laboratory findings, nor in the frequency of perforation among cases with a duration of 24 hours or more. It is worthy of note that despite the shortage of medical personnel in Halifax and the acute wartime overcrowding of hospitals, cases showing suppuration have risen less than 1%. With this in mind it seems a fair assumption that the strikingly higher proportion of suppurative cases admitted to public wards, as compared with the private, reflects on the medical education of the patient rather than on the attentions of his physician.

TABLE
CASES OF THE COMBINED SERIES

	No. of cases	Percentage
Acute, non-perforative.....	236	47.2
Acute, suppurative or gangrenous.....	35	14.8
Acute with perforation.....	30	
Acute with general peritonitis....	9	
Total acute.....	310	62.0
Subacute and chronic.....	190	38.0
	500	100.0
Mortality.....	2	0.40
Mortality in acute appendicitis...	2	0.64

The percentage of acute, non-perforative cases is based on histological diagnoses and is approximately 10% lower than if the clinical diagnoses had been accepted: the subacute and chronic group is, conversely, 10% higher.

In the study of the first 250 cases it was concluded that early diagnosis and operation within 12 hours using the direct approach of a McBurney incision, and the use of the delayed operation in advanced peritonitis, were among the most important factors in attaining a low mortality. Cases 42 and 104, the two deaths, were considered then. We have now treated more than 500 cases without fatality,

and it is on the basis of these that we wish to discuss another factor of major importance in the treatment of appendicitis.

POSTOPERATIVE CARE

This factor is the postoperative care. It has its beginnings in the operating room. The surgeon is closing the incision. Balanced in his mind is all the evidence accumulated there since the case came to his hands; the age of the patient, in years and in arterial elasticity, his general physical condition, his tissue reaction to the infection, made obvious by his pulse, his tongue, and a film of his blood; his probable psychic response to serious illness and, finally the picture within the abdomen. Has the peritoneum, with the often ingenious aid of the great omentum, succeeded in walling off the offending appendix? Is the pus thick, creamy, with a welcome "*B. coli* stink"? Or has the peritoneum been overwhelmed by a deadly streptococcal flush, showing scarlet against the thin grey discharge and the ominous white patches of gangrene?

The surgeon ties the sutures and he makes his decision. He assesses then the severity of the case before him. He will decide that the best means of defence is an offensive. If he foresees paralytic ileus, vomiting of all foods taken, intestinal as well as bacterial toxæmia, the whole terrible assault of a peritonitis, he will not wait till the ileus develops before he puts down his Levine tube; he will not wait for bedside notes of copious vomiting to begin parenteral feedings. Instead, on the basis of the decision he has made in the operating room, he will institute his whole postoperative regimen immediately. It will spring not from what he may come to learn, but from what he already knows.

We like to consider postoperative care in three parts, rest, food, and chemotherapy.

Rest must be both for the patient and the part. This is the principle of the Ochsner treatment. Posturing in Fowler's position is begun as soon as the spinal anæsthetic has passed off. We believe the threatened bad sequelæ of elevating the head after spinal anæsthesia to be based more on faulty theory than clinical fact. But the Fowler's position must not be high. There is nothing more distressing to the patient and his respiratory system, particularly if he be fat, than a position which forces his knees, his dressings, his abdo-

minal fat, and the accumulated gas of the intestinal tract against his diaphragm. He must be low enough to stretch his legs, and to turn slightly from side to side. If the illness be prolonged he is given a footboard to work against.

Immediately after operation he is taught the importance of deep breathing, and how to support his abdominal wall for coughing at regular intervals. He is given no throat or bronchial sedatives. Rest must not be allowed to degenerate into stagnation. For the same reason, a little bit of news from the outside should be brought into his room each day; nothing to disturb him, but to remind him that there is a world waiting for him beyond his closed door.

The importance of morphine for its general effect and its sedative action on the involuntary muscle of the bowel is sometimes appreciated more fully by the surgeon than by the nurse, who may give the drug only when the patient is obviously suffering, unless she be instructed in the importance of its regular administration.

Rest for the gastro-intestinal tract is attained by the use of the Levine tube in the duodenum, attached to the Wangenstein suction bottle. This drains the intestine well. The Miller-Abbott tube, ideal in mechanical obstruction, has little advantage, and several disadvantages in paralytic ileus. Its passage is disturbing to the patient. It advances poorly through the paralyzed bowel. If it does get well down the tract, oral fluids become more than a lave for mouth and throat, as with the Levine tube. They may pass into the intestine and put the bowel to work, in contradiction to the creed of rest.

When the abdomen has been soft and flat for twenty-four hours and when the patient has passed flatus, the tube is clamped off for a test period. It should not be withdrawn while any question of the need for it exists. Having to replace it may haunt the sick, nervous patient with the ocre of a relapse.

The drain, usually placed after the ruptured appendix has been removed, is not disturbed before the seventh day; nor are the dressings immediately about it. This is not alone in the interests of rest. Unfortunately every drain is a two-way street, equally capable of carrying the organisms of contamination in, as it bears away those of the original infection.

We prefer to drain only the base of the cæcum. With the McBurney incision made well to the side the route is short, along the lateral peritoneal wall. After the approved seven days the drain will come away freely and without preliminary shortening. We have seen pelvic abscess develop at least as often when the pelvis was drained as when it was not. We believe that a drain going past the stump of a septic appendix and on to the pelvis encourages the formation of pelvic abscess, rather than preventing it. Most of us are inclined to belittle the striking powers of the peritoneum in combating infection. This beautiful membrane, with the whole bodily resources of blood and lymph streams at its beck and call, is a most potent defensive agent. Through the years, draining fewer and fewer cases of suppurative appendicitis, we have often wondered, as we placed the irritating strip of rubber in place, if we were not only adding to the labours of our best ally.

Food.—The surgeon of scriptural days perhaps saw no message in the saying that man does not live by bread alone. His modern descendant has taken the physical with the spiritual. Carbohydrate alone will not long sustain the healthy. It is wholly inadequate for the sick. A daily 2,000 c.c. of 5% glucose in saline, intravenously, will provide the peritonitis patient with his minimum requirements of 100 grams of glucose, as well as the salt to prevent acidosis and the minimum amount of water against dehydration. The glucose not only provides food in its most readily assimilable form; it helps to preserve the nitrogen balance. But this is not enough.

Protein is necessary because tissues deficient in protein heal slowly, imperfectly, or not at all. It has been shown that the serum protein falls with special viciousness in peritonitis and intestinal obstruction. We have found present laboratory tests of little value in estimating the protein requirement. When the reading is below the normal minimum of 6 mgm. % the need is already obvious in the patient's facies.

Protein in its most important form is, of course, whole blood, to combat the shock of operation and the first flush of peritonitis; and serve as a direct tissue food. The peritonitis patient gets 1,000 c.c. of whole blood post-operatively, or at the beginning of treatment. He continues to get whole blood at frequent intervals till shock and all signs of the need for

protein have passed off. The fact that he has had half a litre, or three litres within twenty-four hours in no way affects the assessment of his needs at the moment.

Supplementing the protein of blood are the total amino acids. Experimental work indicates that these furnish the tissues with nutrient the whole blood lacks, and they are given in quantities of 15 to 30 gm. daily. Special care must be given to intravenous technique when the amino acids are being run in with saline. A leak into the subcutaneous tissues causes sclerosis and temporary disruption of the venous food avenue.

When the patient can take food by mouth, protein again is stressed in the form of beef tea, eggs and milk enriched with powered milk concentrate. The parenteral diet is rounded out by the addition of ascorbic acid daily, because it, too, is necessary for wound healing, being active in the formation of collagen; and also by giving vitamin B complex.

The patient who survives the first assault of peritonitis, perhaps aggravated by the shock of operation, whose temperature and pulse settle again in the valleys, whose gastro-intestinal tract begins again, if feebly, to function, and who then, after a week or more, develops a low grade bronchopneumonia with recurring signs of paralytic ileus and dies—this patient is not primarily a victim of appendicitis, peritonitis or pneumonia. He is a victim of respiratory stagnation and malnutrition.

Chemotherapy.—If the peritoneum does not show evidence of serious contamination or marked reaction to the infection, no intraperitoneal drugs are used. When there is evidence of serious infection we do not believe the danger of sensitivity to the sulfonamides (unless there is a history of sensitivity) should be a deterrent to their use. The intraperitoneal life of penicillin is short, and adequate tissue concentration can be quickly attained by intramuscular injection. The sulfonamides, on the other hand, when given intramuscularly, reach their therapeutic effectiveness slowly. Put into the peritoneal cavity their action is prompt and prolonged.

We work on the rule that 1 gm. of sulfonamide in the peritoneal cavity gives a blood concentration of approximately 1 mgm. per 100 c.c., and that the rapidly absorbed sulfanilamide with the more slowly absorbed sulfathiazole will together give a therapeutically effective

concentration over a five to seven day period. Five grams of sulfanilamide and 7.5 to 10 grams of sulfathiazole are ordinarily instilled.

Penicillin is used routinely in doses of 20,000 units every three hours, its administration being maintained for at least three days after the temperature has fallen to normal.

SUMMARY

A series of 500 consecutive cases of appendicitis, with a mortality of 0.4% is discussed. The early assessment of the severity of the condition in peritonitis, and the prompt institution of the full therapeutic regimen, is a most important factor in attaining a low mortality.

THE DIAGNOSIS AND TREATMENT OF THE OCULAR MUSCLE ANOMALIES

By R. E. Smart, M.D., F.A.C.S.

Ottawa

MANY patients present themselves to the ophthalmologist because they have not obtained relief of symptoms, either from the optometrist or another eye specialist who has overlooked certain findings by doing an incomplete examination. At the present time there appears to be a swing of public opinion away from the optometrist in favour of the ophthalmologist, and it behooves the medical profession for their own good as well as that of the general public, to do what they can to make this swing full and lasting. Every patient should be made to realize by the fullness of their examination, that they have received the benefit of a complete examination which only the ophthalmologist is capable of giving them. In this paper I will endeavour to outline the various procedures which have been described by various authorities before. To have a definite routine of investigation puts the examiner in the happy position of knowing that he has made an absolute diagnosis and when he has done this, the treatment, if any, is clearly indicated in each case.

My experience has been that there are two pitfalls which should receive special attention. The first condition is that of latent hypermetropia which should be adequately corrected, but does not come within the scope of this paper. Suffice it to say that complete cyclo-

plegia and binocular manifest acceptance are necessary to arrive at the proper hyperopic correction to be given.

The second cause of continued symptoms which I have found, is the failure of the previous examiner to recognize and correct the ocular muscle anomalies which are not at all uncommon. It is the purpose of this paper to outline the various types met with and to briefly indicate the treatment.

An accurate diagnosis is a *must* in every case, if relief is to be obtained. Esophoria or exophoria is not a diagnosis at all, and by the same token the Maddox rod test alone is entirely inadequate. Not only is the test extremely variable, depending on the patient's power of accommodation, but it does not break up fusion completely in an individual with a highly developed sense of fusion. One must determine whether a person is esophoric from convergence excess or divergence insufficiency, or whether he is exophoric from convergence weakness or divergence excess.

DIAGNOSIS

One first wants to know if we are dealing with a convergence anomaly or a divergence anomaly. Invaluable information is obtained from measuring the power of convergence to the base line (P.C.B.). This simple test is done by carrying a white pin head along a mm. rule in the midline placed on the bridge of the nose and adding 25 mm. to the distance at which one eye gives up fixation as the bridge of the nose is approached. If surgery on an internal rectus is contemplated it is of some importance to note which of the two eyes gives up fixation, *i.e.*, which internal rectus has the weaker power. Readings from 45 to 100 are considered the lower and upper limits of normal power. A high reading indicates either: (a) Primary convergence insufficiency due to a lesion (congenital or post-encephalitic) of the converging centre (anterior portion of the third nerve nucleus); or, (b) secondary convergence insufficiency due to a primary divergence excess.

Anyone with binocular single vision having a P.C.B. over 100 will suffer discomfort from sustained near work. Emphatically, a patient with a poor P.C.B. must never have an internal rectus recession for convergent squint in cases requiring surgery. This would produce permanent loss of converging power and a strong

possibility of a convergent strabismus becoming divergent postoperatively or in later years.

One could now do a Maddox rod test, preferably with screen, at 20 feet and 14 inches. If this gives the highest abnormal reading at 20 feet we are dealing with a divergence excess (exophoria) or a divergence insufficiency (esophoria). Conversely, a convergence excess (esophoria) or convergence insufficiency (exophoria) produces the highest abnormal reading at 14 inches.

At this stage, I like to do an excursion test in each eye individually in the six cardinal directions of gaze to prove adequate power in each individual eye muscle. This is followed by a screen comitance test which breaks up fusion. Each eye should be watched simultaneously for lagging or over-shooting in the six cardinal directions. This test will bring out any gross paresis and secondary deviation of

muscle. In this case the exophoria is due to a weakness of the converging function or an over-acting diverging centre; which it is shown by the measurement for near and far in the primary position.

Again, if an esophoria or esotropia increases when the patient looks to the right, it is due to a paresis of the right external rectus. If the deviation increases when he looks to the left, a left external rectus paresis is indicated. If the esophoria or esotropia does not increase on looking right or left there is no parietic muscle, but we have an over-acting converging function or a weakness of the diverging centre.

In a similar way the action of each of the elevators and depressors of each eye can be charted and muscle weaknesses localized. If the yoke action of the muscle of the fellow eye is kept in mind, the lagging or weak muscle can be identified. In the case of the upper and

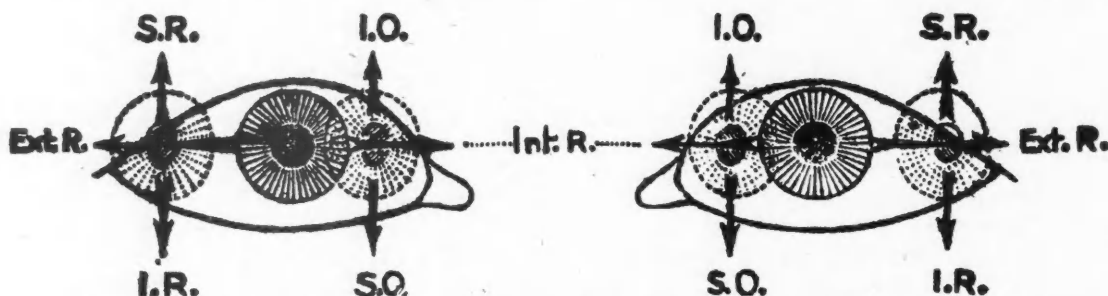


Chart indicating individual muscle action and yoke muscle acting in same field. This chart is conveniently used for charting muscle measurements as the cover test is carried out.

the yoke muscle concerned. It also gives a definite clue as to where to expect to find trouble in doing the Cover Test which follows next.

The Cover Test done with prisms provides us with the most absolute method of detecting and measuring individual muscle anomalies. The measurements are made in the primary position far and near, and in the six cardinal directions of gaze at 16 inches. When completed one is able to pin-point individual muscle paresis and secondary deviations in the yoke muscle concerned. The greatest deviation occurs in the direction of action of the parietic muscle.

In the Cover Test, if an exophoria or exotropia increases when the patient looks to the right it is due to a left internal rectus paresis. If it increases when he looks to the left, it is due to a weak internal rectus muscle. If, however, the exophoria or exotropia does not increase on looking right or left, there is no paresis of any of the horizontal muscles, since the deviation must increase in the direction of action of a parietic

lower fields of action of course, strictly convergence and divergence anomalies do not have to be considered.

Dr. J. W. White, New York City, has published a paper giving the complete detail of the cover test in the *American Journal of Ophthalmology* (24: 156, 1941).

The final test but not the least important is the measurement of accommodation by the Prince rule. This is done with the ametropic correction on, and any weakness found is compensated for by giving whatever reading correction that is indicated in the form of reading glasses or bifocals. A correction of this defect, will give certain relief of symptoms.

With the information obtained from the above tests, we are now in a position to make an absolute diagnosis, i.e.: (1) An anomaly of the convergence function. (2) An anomaly of the divergence function. (3) A parietic internal rectus causing an exophoria or exotropia, or a parietic external rectus causing an eso-

phoria or esotropia. (4) A paretic superior or inferior rectus, superior or inferior oblique muscle causing a hyperphoria (and perhaps a lateral deviation). (5) A paresis of the function of accommodation.

TREATMENT

Prisms in esophorias and exophorias seem to me to be too soon resorted to by many examiners. Generally speaking, I rarely prescribe them in the horizontal deviations as I believe that in the long run they do more harm than good. In the hyperphorias prisms should be prescribed when indicated to correct the vertical deviation in the primary position up to the limit of practicability. Beyond this limit surgery on the elevators or depressors as indicated is the usual treatment. In deciding on any surgical procedure on the ocular muscles, one must always operate in the field of action of the weak muscle or disturbed function, *e.g.*, in divergent anomalies recess or resect external recti; in convergent anomalies, recess or resect the internal recti.

DIVERGENCE ANOMALIES

All, or nearly all, such anomalies have good fusion, no amblyopia and normal retinal correspondence. Hence, all respond well to medical or surgical methods of treatment. Most have an accompanying vertical anomaly.

(a) *Divergence weakness* (esophoria or esotropia).—This constitutes the most difficult group of cases to treat. Correct the refractive error giving as low minus or as high plus as feasible. Correct any vertical deviation in the primary position with prisms, otherwise with surgery. Base out prisms may have to be resorted to in strength necessary to bring up prisms divergence to 4 prism diopters. If esotropia is present for distance, resect one or both external recti.

(b) *Divergence excess* (exophoria, exotropia).—In the early stages converging power is strong but as time goes on, it weakens. Exotropia for distance may be only occasional but later will become constant and converging power weakens secondarily. Converging exercises should be used in the early stages. This may not help divergence for distance but will maintain converging power and relieve discomfort when present. If a vertical deviation is present in the primary position correct with prisms if possible, otherwise operate on the elevators or de-

pressors as indicated, at the same time recessing an external rectus. When exotropia has become a daily occurrence or constant, recession of one or both external recti is indicated and a later resection of an internal rectus if necessary. Estimate a full surgical correction with the first operation. The results are excellent.

CONVERGENCE ANOMALIES

Since convergent anomalies tend to have characteristics of poor fusion, amblyopia and false retinal correspondence the response to treatment is not as good as in divergent anomalies.

(a) *Convergence insufficiency* (exophoria, exotropia).—In organic disease of the converging centre which may be congenital or acquired, exercises, prisms or surgery are of no value. Symptoms only disappear as the eyes acquire monocular fixation for near, with divergent strabismus at near ranges and rapid deterioration of the fusion sense. In functional weakness of the converging centre, there may be only a remote P.C.B. present, with or without a small exophoric error at near ranges. The treatment consists in correcting the refractive error closely for hyperopes and myopes alike. Converging exercises over a prolonged period are very helpful. Anything that can be done to improve the general health will help, and particularly removal of any endotoxin such as focal infection or chronic constipation. Prisms are contraindicated except in patients past middle age.

In convergence weakness with a remote P.C.B. and a high exophoria for near, the refractive error must be corrected for hyperopes and myopes alike, but endeavouring to keep the plus as low as possible or the minus as high as possible. Keep the addition undercorrected for presbyopia. This group constitutes chronic complainers with bifocals and most are better without them. Improve general health in every way possible. Converging exercises are helpful in relieving discomfort if done over a prolonged period. If the exophoria is over 25 prism diopters for near, part of this may be corrected with surgery.

(b) *Convergence excess* (esophoria, esotropia).—Correct the refractive error, giving as high plus or as low minus as possible. Exercises are useless and prisms not good treatment. Central tenotomy, recession of one or both internal recti, whichever indicated should be done. The results are highly satisfactory.

PARESIS OF ACCOMMODATION

When this is indicated by measurement on the Prince rule, give the necessary reading addition, and do not hesitate to order bifocals in patients of pre-presbyopic age.

SUMMARY

The above is considered the minimum investigation necessary in those refractive cases which have not previously found relief. Many patients will not require all of the above tests, but still others will require vergence tests, Maddox cover tests, or preliminary occlusion for not less than 24 hours before cover test to bring out their defect. This outline necessarily touches on the surgical side of the muscle anomalies, but when all the tests are performed an absolute diagnosis is possible so that effective treatment, medical or surgical can be carried out.

Medical Arts Bldg.

CASE REPORTS

OSTEOMYELITIS OF THE FRONTAL BONE WITH BRAIN ABSCESS

By A. N. HARDY, M.D., C.M., F.A.C.S.

Regina

The patient, a man of 45, was admitted to the Regina General Hospital on May 16, 1945, complaining of severe headache, with swelling over right frontal region, general malaise, loss of appetite, nausea and sometimes vomiting.

His illness dated from about April 8, when he began to have headaches which would come on about noon and last most of the afternoon. No history of previous cold in the head. Headaches were relieved by aspirin so that he got a fair night's sleep. Headaches gradually became more severe and his local doctor was called. He was sent to hospital and treated by a confrère during my absence from the city. He was given penicillin therapy and returned home April 27, feeling better, but headaches were still present.

After his return home, heat was applied to the forehead and four days later a lump began to form on the right side of forehead which enlarged rapidly, so that the next day he was brought to Regina to the Grey Nun's Hospital.

An intranasal operation was performed the same day. Swelling by that time had spread to involve both sides of bridge of nose and loose tissue below eyes. Following operation—a submucous resection to relieve obstruction—the swelling receded somewhat. Five days later two small incisions were made into the forehead but no pus encountered. An operation for further drainage of the frontal sinuses was proposed but patient would not consent and was discharged from the hospital. He returned home May 12. Headaches continued severe at home with swelling increasing.

Patient was first seen by me on May 16. He appeared somewhat emaciated, dull and listless. Weight about 125 lb. He complained of severe headache over the frontal bone particularly marked on the right side. There was a large fluctuating swelling extending high up over the forehead into the hair line, and about three inches laterally. Some pus was coming from the naso-frontal duct in the left nostril. The right side showed some congestion in ethmoid region but no pus.

There was some swelling and oedema of both optic discs with margins hazy, marked venous engorgement but no haemorrhages. Pupils normal. No ocular nystagmus. Patient complained of some blurring of vision.

There was no retraction of the head and no rigidity of muscles of the neck. Reflexes normal. Pointing reactions negative. Temperature 102°, pulse 70, respirations 20. Urinalysis, negative except for slight traces of albumin. Red cells, 4,200,000; Hgb. 83%, colour index 0.98, white cells, 12,200, polymorphonuclears 64%, rhab. 27%, lymphocytes 5%.

Respiratory system negative. Wassermann reaction negative.

X-ray Examination: the frontal cells on each side are quite cloudy, more so on the right than on the left. There appears to be a continuation between the two sides above the frontal sinus and extending laterally the bony tissues appear to be denser than usually noted suggesting inflammatory change, while near the mid line there is a suggestion of bony destruction, particularly in one area, which shows a circular area of lessened density suggesting the formation of a bony sequestrum. The left ethmoids are moderately clear, the right ethmoids somewhat cloudy. Left antrum clear, right antrum cloudy (Fig. 1).

Operation was performed next day. On examination of the frontal bone a large fluctuating abscess was found over an area of about 2½ inches extending above the sinuses and slightly to the right, with oedema and marked tenderness over an area of about 4 inches extending up nearly as far as the fronto-parietal suture.

The naso-frontal duct was cleared out and the middle turbinate bone removed as a preliminary to the radical frontal sinus operation. A horizontal incision was made over the left orbit extending from the bridge of the nose outward through the eyebrow for about 2½ inches horizontally, and a vertical incision upwards for about 3½ inches starting from the inner end of the horizontal. The flap was laid open, and about 1½ ounces of pus evacuated on going through the soft tissues. The bone above the right frontal sinus was white and devoid of periosteum over an area of about 2½ inches in diameter, which was found to be soft and necrotic with numerous pin points of pus exuding from its surface. The anterior table of the right frontal sinus was removed as far down as the supraorbital ridge. Both sinuses were filled with thick creamy pus, the septum between being absent. Both sinuses were curetted and an opening established and enlarged from the right sinus into the nose, no drain being inserted. Posterior walls of sinuses appeared healthy. An area of bone above the right sinus for about 2½ inches was removed. This was very necrotic. The dura beneath was a dull grey and covered with granulations. A small sinus was found leading inside the dura. An incision into the dura was made and an abscess encountered extending into the brain tissue of the frontal lobe containing about ¾ ounces of creamy pus. A rubber tube was inserted into the abscess cavity, and the wound dressed with sulfathiazole powder and vaseline gauze, the wound being left open.

The operation was performed under cyclopropane, intra-tracheal anaesthesia given by Drs. Leech and Bowering; 500 c.c. of blood was administered during the operation and an additional 250 c.c. during the evening of the same day. Patient recovered well from the operation. Temperature dropped to 98° next day and then rose to 100°. Pulse 70, respirations 20. Patient however still complained of quite severe headache, and a paresis of the right arm developed. It was thought at first it might have been due to

pressure during operation, but next day paresis in the right arm began to clear and the right leg became gradually involved so that he was unable to move it. Patellar reflexes remained normal.

May 18.—Patient seemed brighter with no headache. Soon after admission penicillin therapy was started, 20,000 Oxford units being given intramuscularly every 3 hours. In addition brandy oz. $\frac{1}{2}$ was given every four hours following the operation with an occasional blood transfusion of 250 c.c.

Tissue report:—Gross specimen consists of 4 gm. of dark red bony tissue from the skull. Sections of these bony fragments show some of them to be necrotic. The supporting tissue is heavily infiltrated by lymphocytes and polymorphonuclears. **Diagnosis.**—Chronic osteomyelitis. Culture of pus revealed *Staph. aureus haemolyticus*.

May 21.—Four days following the operation all pus seemed to have disappeared from the wound. The tube was removed from the brain and the incision in the scalp closed with the exception of an area in the

June 11.—Penicillin discontinued. Wound healed. No tenderness over bone or operative area.

June 19.—All discharge from wound ceased. A small hernia of brain tissue in the region where the tube was inserted for abscess was removed by electrodiathermy, the edges of skin undermined and brought together. Wound closed without drainage. Patient now much improved except for the headaches at night. Allowed up 9 days later, wound healed.

June 30.—Patient complaining of severe pain between eyes. Leucocytes 11,900. Penicillin treatment resumed as before.

There is a considerable swelling at the extreme upper end of the incision. Pressure causes some pus to ooze out of the upper part of the old wound that has broken open. X-ray also shows left frontal sinus completely hazy.

Operation (July 2).—A longitudinal incision was made through the region of the swelling and extended back along the interparietal suture line for about 3 inches beyond the area of the first operation. For about $1\frac{1}{4}$



Fig. 1



Fig. 2

Fig. 1.—Showing bilateral frontal sinus suppuration and osteomyelitis of frontal bone about the sinus area. **Fig. 2.**—Following second operation. Here a double radical Killian has been done, and bone removed back to middle of parietal bones.

region of the abscess cavity. This was covered with sulfathiazole powder and vaseline gauze.

At this time, paresis of right arm and leg had completely disappeared, but headaches were severe particularly at night, when patient would become irrational and it was necessary to use codeine. Temperature remained low, varying between normal and 100.3°. Pulse and respiration normal.

June 4.—Lumbar puncture showed clear cerebrospinal fluid under normal pressure. Leucocytes 377, red blood cells 2.5, marked increase in globulin. Reducing bodies normal. Differential: lymphocytes and polymorphonuclears in ratio of 2 to 1; 15,000 units penicillin injected intrathecally.

June 5.—Lumbar puncture showed clear fluid. Penicillin 15,000 units injected intrathecally. Leucocytes 111. Cultures negative after 48 hours.

The patient made a slow recovery, complaining especially at night of severe headaches usually on the right side of forehead but sometimes on left side or across bridge of nose. He was often irrational and passed urine involuntarily.

inches in width the underlying bone was devoid of periosteum, and was removed (Fig. 2). Beneath this bone and along the longitudinal sinus for about $\frac{3}{4}$ inch in width the dura was red and covered with granulations. In addition a radical Killian operation was performed on the left frontal sinus and a rubber tube inserted into the naso-frontal duct. The wound in the forehead was left freely open to drain and strips of gauze saturated with penicillin placed along the incision. Patient was given supporting blood transfusions and after a few days the wound was closed as all pus had disappeared.

From then onward, patient made steady recovery. After a few days all headaches disappeared. Penicillin was continued in reduced dosage until July 13. On this date, wound was completely healed with no tenderness on pressure and no nasal discharge, though the tube was kept in left frontal sinus for two weeks. Patient was discharged July 20, well. At that time swelling of optic discs had receded to normal and vision was normal.

COMMENT

The first time patient came to the hospital, penicillin was tried, but patient returned later worse than before. The amount of penicillin given by me in this case exceeded five million Oxford units. Of this, thirty thousand units was given intraspinally. The remarkable thing about its action was that in four days, all pus had apparently disappeared from the wound and the abscess in the brain ceased to discharge.

Certain general symptoms were prominent in this case, though the temperature was not high. Patient seemed very ill, dull and listless, with severe headache, occasional vomiting, slowing of the pulse, and swelling of both optic discs. He answered questions slowly.

Severe boring pains were present most of the time until after the last operation. It was most frequent over the right side of the forehead in the region of the brain abscess, but sometimes over the left side and sometimes between the eyes. One could hardly explain this headache as caused by the brain abscess alone, since it persisted following the first operation after the wound was completely healed, but disappeared suddenly following the second operation, so that I would interpret the continuation of headache as due largely to septic bone irritating the dura, though perhaps not sufficient to produce a meningitis.

Even under intensive penicillin therapy, two weeks after it was stopped, and the wound had healed, a recurrence of the osteomyelitis became evident. Whether the left frontal sinus was a factor in causing this recurrence is a question. It was curetted out from the right side at the first operation, the septum between being absent. When operated on the second time, in which a few flicks of pus were found at the extreme outer angle of the sinus and some granulation tissue.

The abscess cavity in the brain once healed did not reopen. Transitory paresis of the right arm and leg were present following the first operation, the arm first and then the leg. Both became normal in about three or four days, the leg being last to be involved and last to clear up. This I was unable to explain except from pressure, and for a time thought an abscess might also be present in the left frontal lobe as well, though the speech centre was not involved. This paresis occurred on the same side as the abscess.

Spinal puncture was not done early in this case owing to the danger in the presence of an abscess. It revealed no organisms in the spinal fluid.

As far as the action of penicillin is concerned I am convinced from my experience with this case, and several chronic sinus cases in which I have used it, that it will rarely cure without operation, but clears rapidly following operation, and drainage is instituted.

It is rather interesting to note how difficult it is to clear up genuine osteomyelitis of the frontal bone even with penicillin, and recurrence is frequent, whereas in case of mastoiditis with bony necrosis extending back into the occipital bone the process is readily arrested and one almost never has a recurrence of the bony extension, even without penicillin therapy. It is no doubt explained by the greater blood supply in the region of the mastoid.

Sulfathiazole powder was dusted in the wound following the first operation in addition to the penicillin therapy given intramuscularly. Following the second operation the wound was kept open and strips of gauze saturated with penicillin solution inserted. In the latter case the wound healed rapidly.

613 McCallum Hill Bldg.

PARÆSTHESIAS OF UPPER EXTREMITY — TREATMENT BY STELLATE GANGLION BLOCK

By S/Ldr. J. M. Janes,

R.C.A.F. Hospital, St. Thomas, Ont.

The traumatizing wounds of modern warfare are a fruitful source of severe paræsthesias. Leriche¹ in World War I, emphasized the rôle of the sympathetic in these conditions. Drugs, local applications, various surgical procedures upon the peripheral nerves, gave disappointing results. When the appropriate sympathetic ganglia were blocked by novocaine or were extirpated, he found that the relief from pain was often dramatic. The blocks often had to be repeated to secure the desired results. Occasionally one injection was sufficient. Why this was so has not been adequately explained other than to say "A vicious cycle has been broken or a reflex arc has been interrupted".

Weir Mitchell in 1864¹ described cases which are now being seen frequently. Referring to the pain, he said "Its intensity varies from the

most trivial burning to a state of torture which can hardly be credited, but which reacts on the whole economy until the general health is seriously affected".

The following case is reported, not because it demonstrates anything new or because it proves anything conclusively. It is presented to draw attention to a method of treating paræsthesias which are being seen in all Service hospitals where surgery of the extremities is being considered.

The history is related at some length because it is felt that it is typical of many such cases.

Sgt. S., age 27, was wounded in France August 26, 1944, by an .88 mm. cannon shell. He suffered a compound comminuted fracture of the upper third of the left humerus with extensive destruction of the deltoid muscle. He received his primary treatment the same

artery and vein and the distal artery and vein were ligated. The median nerve had to be dissected from the aneurysmal sac. (The enlarging sac had no doubt caused pressure on the median nerve resulting in the palsy previously noted. This same occurrence was noted by the writer in a case where wrist drop developed as a result of pressure on the radial nerve from an enlarging aneurysm of the brachial profunda artery.)

On November 21 the note appears that the patient is having "quite a bit of pain".

November 26.—Evacuation of another abscess.

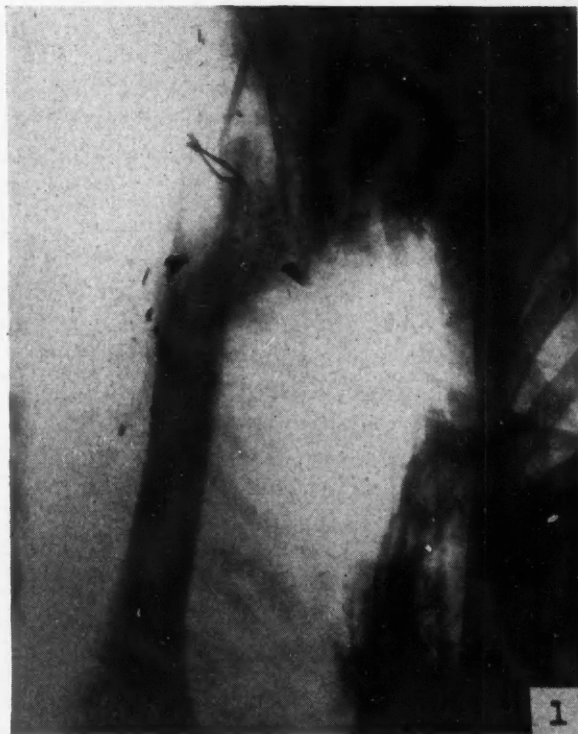
November 28.—Culture reveals coliform bacillus.

December 5.—Left hand cool. Radial pulse not palpable.

December 21.—Dressing in operating room. Profuse foul smelling discharge.

On December 25, the impression is recorded that the nerve lesions (median, radial, and ulnar) may be neuropraxis, axontmesis or possible neurotmesis from bone fragments during manipulation. (The nervous phenomena could all be explained on the basis of the vascular lesion).

On January 13, 1945, the patient was admitted to the Orthopaedic Section of the R.C.A.F. Hospital, St. Thomas, wearing a thoraco-brachial plaster. The recom-



day. On September 1, 1944, he was transferred to England. The plaster was removed and the wounds were very purulent. On September 4, 1944, he was transferred to a Canadian Army General Hospital where the statement was made that there was "no apparent involvement of nerves or vessels in the left hand or arm". On September 11, it was noted that there was a partial median nerve lesion. (This is of special interest in view of later findings). On October 15, 1944, the signs of an aneurysm were noted. (It was not stated whether these were signs of an arterial or arteriovenous aneurysm). The patient continued to run an elevated temperature. On November 13, 1944, the wound in the axilla was probed and enlarged and much pus evacuated. A small sequestrum was removed and wire fixation of the fracture was attempted. The wound was packed open and a shoulder spica applied.

On November 20, 1944, the brachial aneurysm ruptured with considerable loss of blood. The proximal

mendation brought with him urged early treatment, possibly disarticulation at the shoulder. The patient had an expression of pain and emanated a very disagreeable odour from his plaster. The fingers of his left hand were dry, glossy and stiff. The neurologist reported that the patient had considerable joint stiffness, a partial nerve lesion and slight involvement of the ulnar and radial nerves.

The patient's chief complaint was periodic knife-like pain beginning in the upper arm and radiating down into the fingers. He stated that he had not slept without sedatives since his injury. It was noted that he did not magnify his complaint but suffered a good deal in silence.

On February 6, 1945, a large sequestrum and

a piece of wire were removed from his left arm. The patient continued to have severe pain which we were unable to control in spite of frequent administrations of morphine and hyoscine.

On February 13, at 1600 hours, the patient's left ganglion was injected with 20 c.c. of 1% procaine, according to the method described by Ogilvie:²

"With a fine needle, raise a wheal 5 cm. lateral to the 7th cervical spinous process; keeping the same needle, inject 2 c.c. of procaine into the underlying aponeurosis and muscle. A 4 inch needle is now substituted and passed forwards and inwards at an angle of 30° with the sagittal plane and at the same time slightly downwards. If the point strikes the transverse process of the 7th cervical vertebra or the neck of the first rib, which it will encounter at a depth of from 3 to 4 cm., the needle is redirected to pass just above and pushed on until it strikes the side of the body of the first dorsal vertebra at a depth of from 5 to 6 cm. Suction is applied to exclude puncture of a vein or the pleura and 20 c.c. of 1% procaine is then injected slowly".

He developed a ptosis of the left upper eyelid but no marked constriction of his left pupil. The radial pulse which had not been palpable previously became palpable. The pains in his left arm, forearm and hand disappeared. At 2040 hours he had "some peculiar feelings in his left hand but no real pain". He slept for the first time that night without sedatives since he was wounded. He had 36 hours of complete relief from pain, followed by a return of less severe pain for one night (March 4). A further attempt at stellate block did not produce a Horner's syndrome and was thus not considered successful. The patient, however, has to date (May 9, 1945) required no further sedation for paræsthesias. He is up and about and the sinus on the lateral aspect of his left arm is clean and filling in rapidly, following several sequestrectomies (Fig. 2).

The left shoulder, elbow and wrist movements are still grossly limited. The finger movements are improving satisfactorily. The patient's statement on May 8, 1945, was "I now have no pain in my left arm or forearm. I have occasional fleeting pain in my fingers which is not at all severe".

SUMMARY

A case is presented in which severe paræsthesias of the left upper extremity were relieved by the injection of 20 c.c. of 1% procaine into the region of the left stellate ganglion.

Since this case was done we have had a similar but less dramatic result in a case of paræsthesia

of the foot by blocking the lumbar sympathetic ganglia again, according to the method described by Ogilvie.²

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CEREBRAL ANOXIA COMPLICATING SPINAL ANÆSTHESIA

By Captain A. B. Noble, R.C.A.M.C.*

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The harmful effects of anoxæmia on the cerebral cortex have been investigated by Courville. He clearly co-ordinates the types of anoxæmia resulting from anæsthetic accidents with varying degrees of subsequent personality and neurological changes, and in fatal cases with the consistent pathological findings of areas of focal degeneration of the cerebral cortex and of the globus pallidus. His excellent case studies and investigations have resulted in the opinion that most degenerative changes occurring as a result of severe anoxia are irreversible.

Herewith is presented a case report of asphyxia under spinal anæsthesia, with subsequent clinical manifestations indicative of cerebral damage and later evidence of cerebral regeneration and recovery.

This anæsthetic accident occurred on November 26, 1944, at the Montreal Military Hospital. The chief features were as follows:

Patient was a healthy 18-year old male, admitted for emergency appendectomy, premedicated with morphine, gr. 1/4, hyoscine, gr. 1/100, 45 minutes before operation and anesthetized with 20 mgm. 1% pontocaine diluted with 2 c.c. of 10% dextrose introduced into second lumbar interspace without barbotage. The table was placed in 10° Trendelenburg position for one minute. Anæsthetic level was at D-3 in about one minute so table was levelled immediately. A minute later patient became pale, then cyanosed. Respirations ceased approximately two minutes after levelling table. Artificial respiration was commenced, using direct O₂ insufflation and Silvester method. About two minutes after respiratory arrest, the cardiac impulse disappeared following a rapid fall in blood pressure. Resuscitative procedures were used in the following order: (1) Direct O₂ insufflation with Silvester method of artificial respiration. (2) Intra-cardiac administration of adrenaline. (3) Endotracheal intubation and direct administration of oxygen by means of manual pressure on the bag. (4) Intravenous 5% glucose-saline to which was added neo-synephrine. The period of respiratory arrest was approximately thirty minutes and period of cardiac arrest we estimated at about four minutes. Respirations became re-established, and the patient being still uncon-

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scious breathed O₂ through an endotracheal tube while an acutely inflamed appendix was removed. Following appendectomy the endotracheal tube was removed but cyanosis recurred, so that oxygen was given continuously by means of a B.L.B. mask. The patient was returned to the ward, following which he had three clonic seizures of about one minute's duration, each occurring within a period of three hours. Four hours after operation the temperature was 102.2° F. by rectum, pulse 136, respirations 40, blood pressure 90/65 and the patient was still deeply unconscious. Neurological examination revealed slight spasticity of left arm and leg. Colour was well maintained without oxygen but the patient had some pulmonary congestion. On the advice of the neurosurgeons, the patient was placed in the cerebellar position and much tenacious mucus was removed from the pharynx by means of a suction catheter.

The patient regained consciousness twenty-four hours later but was still definitely stuporous. Subsequent progress was as follows:

Second day.—Expression blank. Responded to questions in monosyllables, but speech was incoherent.

Third day.—Speech still thick. Responds to certain questions correctly re date of birth, etc., but still confused and disorientated.

Fourth day.—Still confused. Got up and wandered out of his room. Very euphoric and gait slightly ataxic. Recognized relatives but conversation not lucid.

Seventh day.—Continued improvement. Had a long pleasant chat with relatives who reported he was much like his former self. Confusion subsiding and gait normal. Did simple arithmetical problems correctly. Patient moved to open ward.

By the end of the second week this boy was apparently quite well. He was pleasant, co-operative and was helping about the ward. Yet he made frequent errors when presented with simple arithmetical problems.

We shall here inject certain information regarding his intelligence and aptitude score and work record prior to enlistment. He stopped school in the 8th Grade at the age of 15 years. Work record during the following three years was interesting because of frequent changes of employment. He seldom stayed at one job more than three to four months. M-score (intelligence and aptitude test) on enlistment was 80, which is within lower limits of normal.

On December 8, an electro-encephalogram was done at the Montreal Neurological Institute. The tracing revealed evidence of some degeneration of both frontal lobes, which was attributed to the cerebral anoxia. The opinion was expressed that these changes were probably irreversible. Nevertheless, the boy continued to improve. He was allowed to proceed on New Year's leave and had no difficulty in looking after himself. We retained him in hospital until late in March, 1945. His personality and behaviour seemed normal enough, but repeated psychiatric examinations revealed a persistent impairment of ability to abstract and synthesize. His intelligence tests revealed scores at about the ten year level.

On March 8, 1945, the electro-encephalographic tracings were repeated. At this time a

normal tracing was procured, with no evidence of any residual areas of cortical degeneration. Several days later the M-test was repeated, using a form similar but not identical with the one used on enlistment. The score was 76, essentially the same as at the time of enlistment. Repeated Bellevue-Weschler intelligence tests at this time also revealed considerable improvement. His mental age score was advanced by about six months.

At the following consultation with the neuro-psychiatric staff, it was decided to send the patient to a conditioning centre and to re-assess his mental scores at a later date. We ran into some difficulty here, because the patient became rather tired of these repeated examinations and stated frankly that he did not try very hard. We were also rather reluctant to repeat these tests too frequently because by this time he was well aware that we were attempting to discover some evidence of residual mental impairment and we did not want him to be concerned about this.

Our neuro-psychiatric consultants are of the opinion that this boy now shows no definite evidence of residual mental disability. They have qualified this statement by suggesting that had he been a definitely more intellectual and intelligent individual with a better work record, some changes might have been apparent.

In retrospect, certain points in this case are of definite interest.

1. This boy was revived by continuous resuscitative procedures over a period of thirty minutes after he was apparently dead.

2. Despite the skepticism of some of my friends regarding the value of intra-cardiac adrenalin, a response occurred in this case within two minutes after the injection.

3. Endotracheal intubation affords a direct means of oxygenation of the lungs. The patient's condition improved rapidly following intubation, although there was unfortunately some delay in instituting it.

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SCURVY IN A CREE INDIAN

By Cameron Corrigan, B.Sc., M.D.

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The following are the findings in a case of frank scurvy in a young Indian woman.

On April 1, 1944, a Cree Indian woman, nursing a three-months' old baby, was admitted to hospital, complaining of inability to eat because of painful gums. She gave her age as 29 years, but looked about ten years older. Her height was 5' 6" and weight 135 pounds. Temperature was 99.3°, pulse 84, and respiration 20. She was pale, weak and short of breath on exertion. She had had several nose bleeds lately. Her breath was foul and was offensive even at a distance. On physical examination no abnormality was found in her chest or abdomen, nor elsewhere except as to her gums and lower extremities. The gums were swollen and of a scarlet colour and each interdental papilla stood out like a sack of blood (Figs. 1 and 3). They bled at the slightest touch. The tongue was smooth, atrophic and pale, except at the tip, where it was covered with enlarged and reddened papillae.

The lower extremities showed petechiae and ecchymoses, ranging from bright red petechiae to large livid blotches (Fig. 5). These were distributed over the legs and lower two-thirds of the thigh. On questioning, she admitted having pain in her legs but not in the thigh. This stoicism is typical of the Indian. She stated that the marks on her legs were caused by striking them on the oven door. However, nowhere was the skin broken. Laboratory findings were as follows: hæmoglobin (Sahli) 66%; sedimentation rate 78 mm. in one hour (Westergren); the capillary fragility test was markedly positive; the urinalysis was negative.

On admission she was given 200 mgm. vitamin C intramuscularly, followed by 100 mgm. next day. As it was unlikely that she had a single deficiency, she was given 15,000 units vitamin A, 400 units of vitamin D, 100 mgm. vitamin C, 75 mgm. nicotinamide, 3.3 mgm. riboflavin, 3.3 mgm. thiamine, and 15 gr. ferrous sulphate, all t.i.d. p.c.

The effect of the vitamin C on the gums could be seen within 48 hours. It was as if "the heat had been turned off". Further marked improvement continued during the ensuing week (Figs. 2 and 4). The condition of the gums showed a steady improvement during the next two months; they shrank steadily and the colour changed from an angry red to the normal pink. The interdental papillae shrank also and became pointed. No fresh hæmorrhages occurred in the legs and the signs of the old hæmorrhages faded (Fig. 6). The capillary fragility test at the end of one week was no longer positive.

Enquiry into the patient's diet showed that she had been living entirely on "store foods". She had had no potatoes, fish, nor fresh meat all winter, with the exception of an occasional rabbit. During December, January and February she had eaten a few cans of tomatoes, but none after that period. Her diet was essentially white flour, canned meat stew, salt pork, lard, tea, and milk only when taken with tea.

The living habits of any people have an important bearing on their nutritional status. In the past, left to himself, the Cree Indians of

Northern Manitoba moved from place to place following the waterways in search of fish, which was his staple diet. He hunted moose and snared rabbits as inclination dictated, or the proximity of game allowed. In summer he ate a fair quantity of berries, and when moose and berries were plentiful he made pemmican, which was used in winter or when game was scarce. The basis of his diet was fish or meat. It was "ponasked", or toasted over the coals. Much of it was eaten raw. He drank the blood of the moose. He regarded the stomach and intestines as a delicacy. All was eaten, often including the stomach contents, and none was wasted.

Yet the Indian knew scurvy. It was the Indian who saved Jacques Cartier's expedition to Canada, giving them a tea made of spruce needles, and curing their scurvy. Civilization has changed all that. "Indian medicine" while essentially harmless had many good points. The church has relegated it to the realm of witchcraft, so that even such a simple thing as the brewing of spruce needles has disappeared. Settlements have sprung up, being the places for the women and the lazy to congregate. The trapper and hunter go out, and come back to the settlement where they live on "store goods". Civilization has taught them many things, but it has not taught them to buy wisely. The trader handles such goods as sell well, are easily transported, and will stand frost. The Indian may well be compared to persons of low economic status in the southern United States. They have their sow belly and grits. The Cree Indian has his salt pork and white flour. I saw an Indian child die of scurvy within 100 yards of a trading post, and yet not an orange or a tin of tomatoes could be bought there.

Our patient's husband was one of the shiftless; he was neither trapper, hunter nor fisherman. He existed on odd jobs in the settlement. To make matters worse, some well-meaning individual had helped him to get a cow, a curse in disguise. When he should have been out fishing or working in the summer, he always had the excuse that he had to stay home and cut hay. The animal was never fed enough to give any quantity of milk. Is it any wonder that his wife suffered from malnutrition?

The fact that the patient had been nursing her baby for the past three months, is in line



Fig. 1.—Gingival changes in scurvy—upper gums April 3, 1944. Swelling of gingivæ largely due to hæmorrhage in tissues.



Fig. 2.—Effect of treatment—same as Fig. 1, 8 days later—redness and swelling markedly diminished.

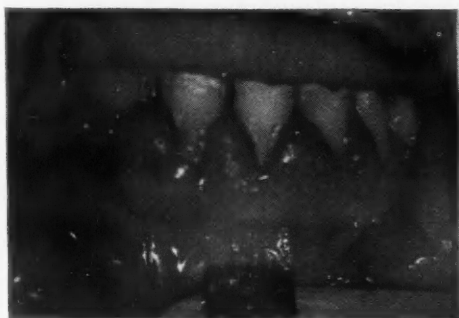


Fig. 3.—Gingival changes in scurvy—lower gum April 3, 1944. Free hæmorrhage from margin of right lateral incisor.



Fig. 4.—Effect of treatment—same as Fig. 3, 8 days later.



Fig. 5.—Skin changes in scurvy—right leg April 3, 1944. Petechiæ and ecchymoses.

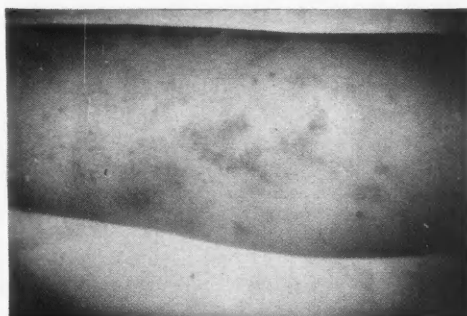
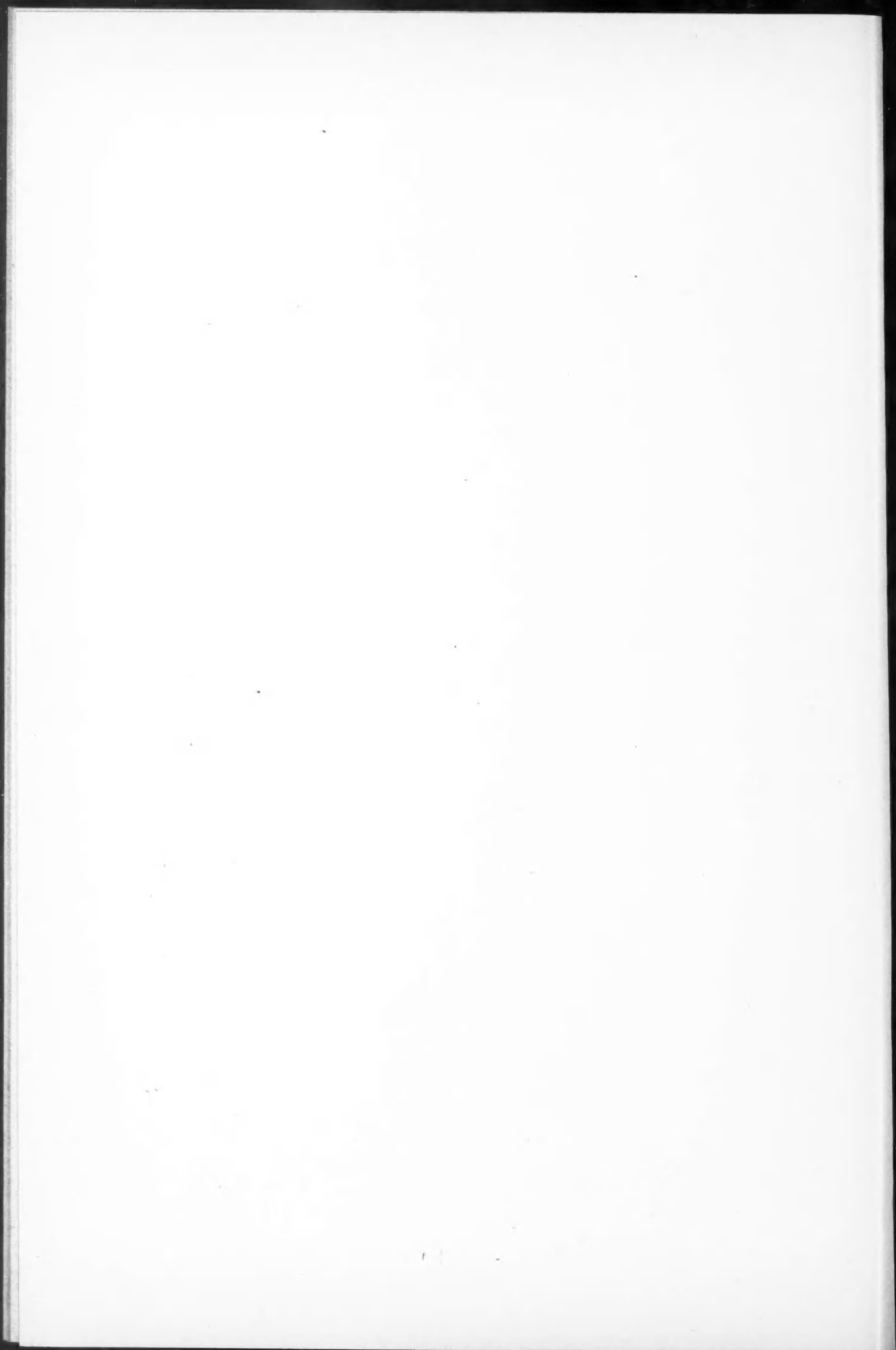


Fig. 6.—Effect of treatment—same as Fig. 5, 8 days later.



with the observation that pregnancy and lactation bring about acute exacerbations of the deficiency states.

SUMMARY

A case of scurvy has been presented, with coloured photographs, showing typical hæmorrhagic lesions of the gums and legs. Pictures taken before and after therapy are shown. Bleeding and swollen gums were noted at the same time as petechiæ and ecchymoses. The case responded to vitamin C therapy. The deficiency state appeared to have been exacerbated by pregnancy.

SPECIAL ARTICLE

IRRESISTIBLE IMPULSE AND CRIME

By W. C. J. Meredith, K.C., M.A.

Montreal

Most psychiatrists agree that a person's mind may be so deranged temporarily that, *although he knows he is doing wrong*, he is powerless to resist an impulse to commit some criminal act. Yet the laws of England, Canada and the majority of American States refuse to admit the defence of irresistible impulse, and hold that an insane criminal must be held responsible unless at the time of his crime he was *unable to distinguish between right and wrong*.

This apparent conflict between Medicine and Law has met with a good deal of criticism, and strenuous but unsuccessful efforts have been made to bring the tests of irresponsibility into line with medical science. In England shortly after the first World War several atrocious murders were committed by ex-service men. Doctors explained that the men's nerves had been shattered by the devastating effects of modern warfare, and that they were insane. But as they were able to distinguish between right and wrong, they were sentenced to death. In at least one case,¹ the Government intervened and granted a reprieve. Public opinion was aroused, and finally a committee of eminent jurists was formed under Lord Justice Atkin to

consider what, if any, changes should be made in the law.

Backed by the advice of the British Medical Association, the Atkin Committee recommended the recognition of irresistible impulse as a defence.² The Medical Association had made it clear that unsoundness of mind could no longer be regarded as essentially a disorder of the intellectual faculties, that it was something much more profoundly related to the whole organism—"a morbid change in the emotional and instinctive activities, with or without intellectual derangement". But the law remained unchanged, and an astonished public learned that the tests of irresponsibility in the greater part of the English-speaking world were eighty years old.

It should be recalled that at one time lunatics were considered possessed of evil spirits and could expect no mercy from the law. Following that primitive stage came a succession of rulings, requiring generally a condition of complete madness to escape punishment for a criminal offence.³ However, by the beginning of the Nineteenth Century, it was recognized that insanity was a *mental illness* which could take many forms, and it became necessary to devise new tests to decide when an insanity defence should succeed. The whole question came to a head as a result of the celebrated trial of Daniel M'Naghten in 1843.⁴

Labouring under a delusion of persecution, M'Naghten murdered the Secretary of England's Prime Minister, Sir Robert Peel, but was acquitted when the jury declared him insane. So unpopular was this verdict that, following a debate on the subject, the House of Lords decided to ask the opinion of a number of English judges upon the law relating to the insanity defence. The judges' answers, famously known as "The Rules in M'Naghten's Case", held that the correct test was *the ability of the accused to distinguish between right and wrong with respect to the particular act with which he was charged*. Rendered before the science of

2. The Committee's Report was published in November, 1923.

3. In 1723, Mr. Justice Tracy held in *Rex vs Arnold*, (16 St. Tr. 704) that "a prisoner in order to be acquitted on the ground of insanity must be a madman that is totally deprived of his understanding and memory, and doth not know what he is doing no more than an infant, than a brute, or a wild beast."

4. *Rex vs M'Naghten*, 10 Cl. and F. 200. The name is spelled variously, e.g., McNaughton, M'Naughten, etc.

1. *Rex vs True*, 16 C.A.R., 168, (1922).

psychiatry was born, that opinion has since been followed in England,⁵ Canada⁶ and the majority of American States.⁷ Some seventeen States, while still retaining the right and wrong test, have also admitted the defence of irresistible impulse. One or more States have no universal test.

The inadequacy of the M'Naghten formula is evident from the advice of the British Medical Association, already referred to, and from more recent opinions of psychiatrists who say that insanity attacks the will and emotions as frequently, if not more often, than the intellectual powers, and that a conative form of insanity (affecting the will and emotions) can exist alongside an unimpaired intellect. For example, mothers have been known to murder their infants without any apparent reason. In some instances they felt the increasing impulse to kill, and asked that their infants be taken away from them for the night, but they succumbed to the recurring impulse a few days later. In other words, a sane intellect may be governed by an insane will.⁸

What then is the objection to the irresistible impulse defence? Undoubtedly the chief objection is the difficulty of proof—determining

5. In 1937, the late Chief Justice of England, Lord Hewart stated: "The well settled law, derived from the answers given by the judges in M'Naughten's case, remains absolutely unimpaired. . . . Three distinct things must be clearly proved to the satisfaction of the jury, namely: (1) That at the time of committing the act the prisoner was suffering from disease of the brain; (2) that because of that disease he was labouring under an infirmity of reason; and (3) that, in consequence of these two matters, he either did not know what he was about or (alternatively), if he did, he did not know that what he was doing was wrong."—Lord Hewart in "Not Without Prejudice" (Hutchinson & Co. Ltd., London).

6. The Canadian Law which applies in all the provinces is set forth in Section 19 of the Criminal Code as follows:—

"(1) No person shall be convicted of an offence by reason of an act done or omitted by him when labouring under natural imbecility, or disease of the mind, to such an extent as to render him incapable of appreciating the nature and quality of the act or omission, and of knowing that such act or omission was wrong.

(2) A person labouring under specific delusions, but in other respects sane, shall not be acquitted on the ground of insanity, under the provisions hereinafter contained, unless the delusions caused him to believe in the existence of some state of things which, if it existed, would justify or excuse his act or omission.

(3) Every one shall be presumed to be sane at the time of doing or omitting to do any act until the contrary is proved."

It should be noted that while the burden of proving guilt is upon the Prosecution, the burden of proving insanity is upon the accused.

7. Weihofen—"Insanity as a Defence in Criminal Law" (1933) page 64 et seq.

8. "Psychological pressures can drive a person to inhuman conduct as irresistibly as disease"—"Clinics," Vol. I, page 1367, G. M. Piersol, M.D., (1943, J. B. Lippincott Co.).

whether the crime was irresistible or merely *unresisted*. Nobody seriously contends that crimes of passion, such as sexual offences and acts committed in fits of temper, should be included in this category. The problem arises only when there is definite evidence of insanity co-existing with a knowledge of right and wrong, and it is in such cases that many judges frown upon evidence that the prisoner was unable to control his actions. Said Judge Riddell of Ontario: "If you cannot resist an impulse in any other way, we will hang a rope in front of your eyes and perhaps that will help".⁹

It must not be forgotten that an insane person frequently is aware of his condition: for instance, after assaulting a warden, he will sometimes say: "You cannot touch me, I am a lunatic". He is cunning, deceitful, and often capable of planning and executing a crime with meticulous care. Society, therefore, must be protected from any loose application of the irresistible impulse defence, although in the light of modern medical opinion it should receive at least a modified recognition.

If the first World War is any criterion, the gigantic struggle so recently ended is likely to result in a marked increase in insanity and crime, and renewed efforts to bring about a change in the law may be expected before long. When that time comes, we should bear in mind the words of Chief Justice Gibson of Pennsylvania, spoken many years ago, but equally true today. Referring to irresistible impulse, he said: "The doctrine which acknowledges this mania is dangerous in its relations, and can be recognized only in the clearest cases".¹⁰

9. *Rex vs Creighton*, (1908) 14 Can. Crim. Cases 349. In *Reg. vs Thomas*, (1911) 7 Crim. App. Cases 36, Mr. Justice Darling of England remarked: "Impulsive insanity is the last refuge of a hopeless defence".

10. *Commonwealth vs Mosler*, (1846) 4 Pa. St. 264.

To every poet, to every writer, we might say: Be true if you would be believed. Let a man but speak forth with genuine earnestness the thought, the emotion, the actual condition of his own heart; and other men, so strangely are we all knit together by the tie of sympathy, must, and will give heed to him. In culture, in extent of view, we may stand above the speaker or below him; but in either case his words, if they are earnest and sincere, will find some response within us, for in spite of all casual varieties in outward rank or inward, as face answers to face, so does the heart of man to man.—Thomas Carlyle.

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(Information regarding contributions and advertising will be found on the second page following the reading material.)

EDITORIAL

DR. ALBERT G. NICHOLLS

THE *Journal* announces with deep regret the death of its former editor, Dr. A. G. Nicholls. The details of his life will be found in our obituary column, and we should like to add our tribute to his memory. Dr. Nicholls took over the editorial work of the *Journal* from Dr. A. D. Blackader and very soon began to justify his appointment. During his term of office the *Journal* developed steadily, and its growth is due to Dr. Nicholls' unwavering insistence on high standards. No trouble was too great for him in the editing of material, and if at times he seemed to be over-scrupulous he usually had something to show for it. He himself was possessed of an unusually lucid and easy style which had been acquired over many years of writing but was partly also a reflection of his clear and orderly mind. To this he added a temperament which was never ruffled and a dignified tenacity of purpose. His pleasant, easy manner was greatly missed when he retired from his editorial work, to which he was so attached and which he did so well.

THE GROWTH OF OSTEOPATHY IN MAINE

THE widening activities of non-medical practitioners is described in a recent article in *Medical Economics*,* which points out with most disquieting clarity how deeply osteopaths are entrenched in the State of Maine. In that State, they are granted the right "to use such drugs as are necessary in the practice of surgery and obstetrics, including narcotics and anaesthetics" and to sign birth certificates and commitment papers; they may use the prefix "Dr." and may send their patients into State-aided hospitals and treat them in their own way.

1. MORRISON, W. H.: Osteopaths score while physicians squabble: *Medical Economics*, February, 1946.

How all this has arisen in Maine is a long story. The war helped indirectly; osteopaths were not eligible for commissions and so had not the same pressure on them by the Procurement and Assignment Service as did medical men; the shortage of doctors made many people turn to osteopaths for treatment; doctors were too busy and prosperous to carry on any definite opposition to the growing activity of the osteopaths. But it is not all to be ascribed to the war. The osteopaths have earned their development by endless active effort always in the direction which has most immediate effect, that is, legislative quarters. Here their strength cannot be minimized. They employ the method of direct testimonial which is not used by medical men, a method of most potent influence on the mind of the legislator. But while the osteopath has a particularly strong organization in Maine he has also succeeded in obtaining a certain amount of Federal recognition, such as the right of veterans to attend osteopathic colleges, with their tuition and subsistence paid for by the Government. Osteopathic hospitals apparently have no difficulty in obtaining the services of registered nurses. They are well paid and are given responsible work.

All this and much more adds up to a very strong position for osteopaths, so long as they continue to strive actively to expand their work, and it is not to be expected that they will become less active.

The situation in Maine is perhaps somewhat more sharply contrasted than elsewhere in the States, and certainly more so than in Canada, but as is pointed out by Dr. Morrison it will have to be faced by the profession sooner or later. Who shall say how this is to be done? It is difficult to answer claims made in a spirit fundamentally differing from that of medicine without making a parade of our ideals which is distasteful to say the least of it and probably would not be effective. As regards scientific advance we are on strong ground and one whose advantage should be fully developed. In what sense has osteopathy ever contributed to any advance in medical knowledge? What research has been done or is possible under osteopathy? Will the teaching of osteopathy submit itself to the close scrutiny of unbiased observers as readily as will our

medical colleges? These are points which should be brought before our legislators in season and out of season. In no other way can the phantasies of osteopathy be set in their proper light.

But whatever methods we may employ to expose the dangers of the shallow pretentiousness of osteopathy we can eventually succeed only by the convincing proof of honesty in our own work.

EDITORIAL COMMENTS

Erratum

In the paper "Tick-Borne Diseases of Man in Alberta" which appeared in the November, 1945, issue of the *Canadian Medical Association Journal*, 53: 459, the authors regret that they omitted to include reference to a paper entitled "Rocky Mountain Spotted Fever in Canada", by J. H. Duncan, M.D., C.M., which appeared in the *Journal*, 37: 575, 1937, in which Dr. Duncan reports that spotted fever occurred in Alberta as early as 1923.

CLINICAL and LABORATORY NOTES

CELLONA TECHNIQUE IN PREPARING MOULAGES*

By John W. Gerrie, M.D., C.M.,
Captain Stephen L. Drulak, R.C.A.M.C. and
Eleanor Sweezey, B.Sc.

Montreal

In the field of plastic surgery, moulages have become a means of permanently recording the progress of patients undergoing different phases of surgery, and also serve as an implement in planning reconstructive surgery or in preparing anatomical prostheses. The method of reproducing various parts of the human body in form is achieved by a process referred to as moulding and casting. This procedure entails first the preparation of the impression or mould, often referred to as a negative, and secondly producing from the mould a casting or positive. The casting or finished copy of the original specimen, in form and often in colour and texture, is frequently called a moulage.

* From the plastic Surgery Services of the Montreal Military and Saint Anne de Bellevue Hospitals and the Department of Veterans' Affairs.

A review of the literature on this subject reveals that the common substances which have been used in preparing a negative are wax, gelatin, plaster of Paris in powder form, latex, negocol, agar, terra cotta and other clays. Moulages are in frequent use in the Plastic Surgery Department of the Montreal Military and Saint Anne's Hospitals. They were introduced by one of us (J.W.G.) in an "all plaster" technique. This was developed by Captain Drulak into our present cellona technique as described in detail in this article. Now we find in preparing negatives,—for example where a moulage of a face, hand, foot or ear is required,—that cellona plaster of paris bandage cut into strips serves this purpose admirably. Our medical artist now uses this technique routinely with a uniformly satisfactory result.

The materials necessary for preparing a cellona mould consist of a jar of vaseline, a tongue depressor, a small paint brush, a drinking straw cut into 1½" lengths, an open container of water, an operating room cap and cellona strips. The cellona strips may be prepared from either a roll cellona bandage or cellona slabs by cutting these into three different sizes. (1) Long strips measuring 6" x ¾" to be used along the margins to form a border for the negative. (2) Rectangular strips 1½" x 2½" used in the construc-



Figs. 1 and 2



tion of the remainder of the negative with the exception of small concave and convex areas such as the tip of the nose, the ala, canthal regions and lateral aspect of the ears where (3) small pieces measuring $\frac{3}{4}$ " x 1" are necessary.

With the patient in the supine position, the hair being covered with an operating-room cap, the preparation of the negative is started by first coating the eyebrows, eyelashes and hair over the temples with a film of vaseline. Straws are inserted into both nostrils to provide a channel for breathing. At this point the patency of the nasal passages must be ascertained, for if breathing is impossible through the nose, the straws may be held between the patient's lips to provide an alternative means of breathing when the face is completely covered with cellophane strips. If a full facial mouldage is required, that is, where the lateral aspect of the ears and anterior neck is to be included, the external auditory canals should be packed lightly with vaseline gauze or cotton. In applying the cellophane strips to the face, first the long strips are individually immersed in water and applied along the superior margin of the forehead, the posterior portion of the ascending rami as well as the lateral and inferior aspect of the neck, to form the border of the negative. At least five layers should be used, as this forms a strong

frame for the negative, facilitating separation from the face without distorting the mould. This is an important feature in obtaining a true casting. Fig. 1 shows the border of the negative completed and half of the face covered with wet rectangular and small cellophane strips. It is important to smooth each strip of wet cellophane with the fingertips or with a small paint brush flush against the adjacent area of skin that is to be covered, as small air bubbles trapped below the strips result in an imperfect mouldage.

When the entire face is covered with approximately four layers of strips, ten minutes should elapse to allow the negative to harden before separating it from the face. Fig. 2 shows the negative ready to be separated from the face.

Separation occurs easily after passing a tongue depressor between the negative and forehead of the patient, in this manner freeing the forehead and temporal margins of the negative. The removal is completed by simply grasping the forehead margin of the negative and gradually elevating the mould.

It is advisable to dry the negative for an additional fifteen to thirty minutes after removal from the face, before preparing the positive. If this is not done, the plaster of paris impregnated in the strips forming the negative will generally stick in small patches to the posi-

tive thus destroying the finer details of the moulage. Coating the inside of the dried negative with a film of green soap before the positive is poured prevents this patchy sticking and also facilitates separation.

In pouring positives we have used plaster of paris, artificial stone and various dental impression plasters. These materials are prepared for pouring by gradually adding the powder to a container three-quarters filled with water and stirring the contents with a spatula until a consistency comparable to thick cream is reached before it is poured into the negative.

Fig. 3 illustrates the pouring of a positive; the forehead and neck portions have been closed with folded lengths of wet cellona bandage to aid retention of the substance used in casting.



To obtain a light cast, the negative should only be half-filled with the pouring material. By tilting and at the same time rotating the negative, the inside walls first become coated and as setting continues, the walls of the positive are further reinforced by working the material up with a spatula until a thickness of approximately one inch is reached.

After the positive has set in the negative, as shown in Fig. 4, the unit should be placed aside to dry for thirty minutes.

Separation of the negative from the positive is accomplished by elevating the negative or by simply tearing away the dried cellona strips, destroying the negative as shown in Fig. 5.

Fig. 6 shows the patient and the completed moulage for comparative purposes; the latter ready for final alterations and colouring if reproduction of colour is desired.

Fig. 7 shows castings of ears and a hand prepared by using cellona strips in the construction of the negative.

A negative of an ear is prepared in two sections. First a lateral shell is prepared on the ear and then a posterior shell is constructed in a similar manner after the lateral shell has been removed. Marginal lines are drawn on both shells corresponding to an imaginary line coursing along the helix of the ear. Both shells are

then trimmed along this drawn marginal line, thus facilitating the approximation of the two shells in assembling the negative. The negative is completed by binding the two shells together with wet cellona strips and set aside to dry before pouring the positive.

In casting a hand, the negative is prepared by covering the dorsum of the hand and fingers with wet cellona strips. When this dorsal shell has dried, the hand is removed and the margins along the lateral and medial aspect of the shell, as well as between the fingers, are trimmed. The hand is then returned into the dorsal shell and completely covered with wet cellona strips while it is held firmly pressed against the shell. Using this technique, the hand may be removed in the fashion one removes a glove providing the negative does not extend proximal to the largest circumference of the hand. The positive is prepared by pouring into the "glove-like" negative.

In conclusion, we feel we are justified in stating that negatives prepared by using the cellona technique are far superior in comparison with other methods as they permit larger areas to be reproduced. These negatives may be prepared easily and quickly and require no elaborate equipment. They are thin yet strong, easily separable from the specimen as well as the positive and have the added advantage of enabling reproduction of every detail of the original specimen.

MEDICAL ECONOMICS

What Do You Know About Health Insurance?

Prepared by the Committee on Economics.

As we in Canada face a period in which public discussion regarding Health Insurance may become active, it is highly desirable that terms in common use shall be clarified, so that when we use these terms we shall all be thinking of the same thing.

Q. What is State Medicine?

A. State Medicine is a method for the provision of health services in which all the individuals rendering the services are employed by the State and are usually members of the civil service. Funds are provided by the State by taxation, and the services are usually paid for out of General Revenue. In many countries in which State Medicine exists the institutions rendering the services are also state institutions, but where they are not State institutions they render their services to the individual as a result of a contract with the State.

Q. What is Health Insurance?

A. Health Insurance is a plan for the provision of medical care, using that term broadly, in which contributions are made into a fund, either by the individual himself or on his behalf, or partly by the individual and partly on his behalf, in return for which he becomes entitled to the benefits provided under the plan.

Q. What is compulsory Health Insurance?

A. Compulsory Health Insurance is a form of health insurance in which the State participates and enacts a law under which all individuals in a specified area or class are required under the law to make certain contributions and become thereby entitled to participate in the benefits provided under the plan. In practice, this requires that the State make the necessary contributions for those who are unable to make their own.

Q. Under State Medicine, how does the individual obtain the necessary medical services?

A. Certain patients are allocated to the care of an individual practitioner who then becomes responsible for giving all services or arranging to have them given. Those rendering the services are paid by the State, usually on a salary basis.

Q. Under Health Insurance, how does the patient obtain the necessary medical services?

A. Under a plan of Health Insurance, using that term strictly, it would be pretty much as they do now, the patient going to the doctor or hospital of his own choosing. The difference being that when the services have been rendered, the bills for these services would be paid out of the Insurance Fund rather than by the patient.

Q. What are the requirements for a sound Medical Service?

- A. (a) Uniformly high standard of education and training for professional personnel.
(b) Fully organized services for the prevention of disease and the attainment of a high degree of physical fitness.
(c) Readily accessible adequate medical care, to be given by the physician or other professional personnel selected by the patient and, as necessary, in the institution selected by him.
(d) Full and ready access to all necessary specialist and consultant services.
(e) Ready access for the general practitioner to the necessary facilities and specially trained personnel to assist him in making accurate diagnoses.

Q. What are the necessary requirements for a sound Diagnostic Service?

A. (a) Provision for examination by a physician well trained in clinical procedures.

- (b) Free access as required by the practitioner, to all necessary diagnostic facilities such as x-ray and laboratory facilities; free access to necessary special types of examination carried out by professional men having training in these special fields; most important of all, ready access, as required, to consultant service, to be rendered by men of wide experience and special training, skilled in assessing the existing clinical signs and symptoms, and in interpreting the facts assembled through the laboratory and by means of other diagnostic procedures.

Q. What is meant by the "doctor-patient relationship"?

A. Two things:

- i. The patient shall have the right to be treated by the doctor of his choice in a relationship fully confidential.
- ii. The full responsibility of the practitioner shall always be to the patient. No third party, either a State supervisor or any one else, should have the right to interfere with or regulate or hamper the right of the physician to place the needs of the patient as he knows them to be, as his first and only consideration.

Q. How may doctors and other professional people be paid under Health Insurance?

A. Doctors may be paid on a "fee-for-service" basis, on a "capitation" basis, or on "salary", or by a combination of these methods.

Q. What is meant by a capitation basis for payment?

A. By capitation is meant that a certain number of individuals are allocated to a particular doctor, either by being selected by the patients as the doctor of their choice or by some other method of distribution. The doctor is then given a certain amount per capita per annum in return for which he gives to his patients whatever care they need and he can supply. The patients allocated to one doctor are usually spoken of as his *panel*.

Q. What are some of the advantages of the fee-for-service method?

A. Advantages of this method are several, among which may be mentioned:

- (a) A definite reward for each unit of service is some incentive to stimulate promptness, industry and efficiency.
- (b) This method is always combined with the "free choice" of doctor by patient, and it supplies extra reward for unusual effort or application or ability.
- (c) It renders keeping of accurate records necessary. They become the only basis for payment. The keeping of accurate

records is extremely important in a good service.

Q. *What are some of the disadvantages of a Fee-for-Service method of payment?*

- A. (a) In the hands of a few practitioners this might lead to the rendering of unnecessary services.
 (b) Those administering a plan do not like this method because they are not sure what their accounts for services are going to amount to. They cannot budget accurately for these costs.
 (c) The necessary accounting and filling of forms is unwelcome to some professional men.

Q. *What are some of the advantages of a Capitation method of payment?*

- A. (a) It is simple both for the doctor and for the administration.
 (b) The more patients on a doctor's panel, the greater will be his income.
 (c) It almost eliminates keeping accounts and filling of forms.
 (d) It puts a premium on "keeping people well", inasmuch as no special payment comes to the doctor when he is treating them for any illness.

Q. *What are some of the disadvantages of the Capitation method of payment?*

- A. (a) In some countries and in the hands of some men it has tended to careless treatment.
 (b) In some countries the "panels" have been large and then the doctor selected by these patients engages young men who in reality do most of the work, often at inadequate salaries, and the quality of the service rendered becomes unsatisfactory.
 (c) It does not provide special reward for unusual ability or energy or application.
 (d) When all the individuals in a community have been placed on someone's panel, it is difficult for a new doctor to obtain a practice. This would stimulate the custom of buying and selling practices, which is undesirable.

Q. *What are some of the advantages of payment of doctors on a Salary basis?*

- A. (a) The doctor has the advantage of knowing what his income will be.
 (b) The administration knows exactly what its financial obligations are.
 (c) It allows of emphasis to be placed on "keeping people well".
 (d) It enables some communities to secure a resident doctor when it otherwise might not do so because of small population or other uncertainties.

(e) Salaries, when paid by the State, are usually associated with claims on a pension fund.

Q. *What are some of the disadvantages of payment on Salary basis?*

- A. (a) It does not provide any special reward for unusual ability or application in any given case.
 (b) Because the size of the salary is determined not by the patients but by some official under whom the doctor works, there easily develops a tendency for the doctor to think partly of pleasing this official who determines his salary. It is extremely important that the doctor's sole obligation should be to his patient. The desire for preferment may lead to the selection of a line of treatment which is perhaps less expensive and not primarily in the patient's interest, but which will "make a better showing" in his reported work.
 (c) In practice it is difficult to ensure that an equal amount of work is performed by men securing the same salary. This of course would be a more definite objection where several men were practising in the same area.

Q. *What is meant by Administration in speaking of health plans?*

- A. By administration we mean the authority which is set up to receive the funds, to plan the services and the method of rendering them and to arrange for the provision of services by institutions or professional or other personnel.

Q. *What methods of administration are commonly considered?*

- A. Administration by a Department of Health and administration by an "independent" Commission.

Q. *What is meant by administration by a Department of Health?*

- A. This is the method which would always be followed in a system of State Medicine. By a very generous interpretation of terms it could be used in a system of State assisted Health Insurance. Under this method of administration the Minister would be in charge of the operation of the Plan or he might appoint a Director of Health Insurance, responsible to himself, to operate it. In this type of administration the method of payment might be by "fee-for-service", by "capitation", or by "salary", though the tendency is towards a salary basis. Where salary is paid by the Department of Health the individual is often a member of the civil service and entitled to all the advantages and subject to any disadvantages which this entails.

Q. *What is meant by administration by an Independent Commission?*

A. A completely independent Commission would be one which was divorced from any government control, i.e., an independent, corporate body. In practice, Commissions are usually appointed by the Lieutenant-Governor-in-Council for a term of years. The members thereof may be nominated by professions and interests concerned. An "independent" Commission so appointed would operate the plan and they would report to the legislature through the Minister of Health.

The Commission might be either small or large. A small Commission would probably be three full-time appointees who would administer the plan in all its details. If this type of Commission were appointed, there would also be appointed an Advisory Committee, or Committees, representing those giving and receiving the services, who would meet from time to time to consider policies and offer advice.

If the Commission were a fairly large group it would contain representatives of all interested in giving or receiving the services. They would meet at specified intervals and be paid on a part-time basis. Such a Commission could engage a full-time Director to carry out the policies and procedures determined by the Commission. Or the Chairman of the Commission could be appointed on a full-time basis and he could administer the detailed operation of the plan. With this large representative Commission the necessity for the general Advisory Committee would largely disappear.

Q. *What is meant by the term "Municipal Doctor Plan?"*

A. Under this plan, which grew up first in Saskatchewan, a Municipal Council is empowered to make a contract with a medical practitioner or practitioners, under the terms of which the doctor would give necessary medical care or at times medical and surgical care, of which he is capable to all the residents of the municipality without any payment by the individual at the time of service. Payment is usually on a salary basis, but under existing legislature in both Saskatchewan and Manitoba the payment may be by fee-for-service or by capitation.

Q. *What are some of the advantages of the Municipal Doctor plan?*

A. It has enabled rural districts to obtain and keep doctors where it would have been difficult to secure these services by any other method.

It has secured for these districts considerable preventive health services.

Q. *What are some of the disadvantages of the Municipal Doctor Plan?*

A. Modern medicine should not hold out to a community any "single doctor service" as being the best we can offer. It is a valuable service; it is and has been of great service to many communities, but it is very definitely limited.

It has placed the doctor somewhat at the mercy of municipal councils. This is less of a danger now since central boards are exercising some control over these contracts.

In times of economic stress there has been a tendency to engage individuals on inadequate salaries.

It has been difficult to interest enough well trained men, because of the economic factor, the professional loneliness, and the limited future ahead of these services.

There have been complaints of an unreasonable number of demands on the services of the doctors. These have been less than anticipated.

MEN and BOOKS

SOUTHERN ALBERTA MEDICINE IN THE 'EIGHTIES

By Heber C. Jamieson, M.D.

Edmonton

Before 1880 there were few whites in what is now Alberta. Edmonton consisted of twelve log houses exclusive of the Fort. Three years later no white settlement existed between Edmonton and Calgary, but Fort Macleod and Lethbridge were developing in the south. The total white population of the whole region was 5,000. The coming of the C.P.R. main line gave an impetus to settlement from Medicine Hat to the foothills of the Rockies. It arrived in Calgary in August 1883. A branch line to Lethbridge shortly after made it an important centre. The Calgary and Edmonton Railway which was completed in 1892 opened up the country between them for settlement.

The earliest medical men to practise in the centres established along the railway were those employed on construction work and at first were graduates of eastern Canadian schools. The Medical School in Manitoba soon began to supply its quota. It may be of interest to mention that in the 'eighties there were 13 medical schools in Canada as against 9 now. Ontario had 6, two of which were for women, one at Kingston and one at Toronto. Quebec had 4, Nova Scotia two (one for examining only) and Manitoba one.

In all of Canada there were only 21 general hospitals, three marine hospitals and two for sick children. Toronto General was the largest with 340 beds. The Marine Hospital, Quebec, had a bed capacity of 325. The Hôtel Dieu, Montreal, with 300 was third in size. Only four others boasted of between 100 and 200 beds. Some had less than 20 beds.

Six medical journals existed, four were published in Montreal and two of these were in French. *The Maritime Medical News* of Halifax and *The Manitoba Lancet* served the far East and far West respectively.

Although a few men attempted private practice in Alberta at this period, only fourteen were registered by the North West Territories Council as residing in this area in 1889. It would appear as if surgeons of the Mounted Police were not required to register while in the Force.

MEDICINE HAT

During construction days Medicine Hat which had been chosen as a future divisional point on the C.P.R. had a small temporary hospital. In the Fall of 1887 when the town numbered several hundred inhabitants a meeting of citizens was called to consider the building of a permanent hospital. In the following year an application was made for incorporation. On November 22, 1889 the act of incorporation was passed. The hospital was opened February 1890 by the Lieutenant-Governor of the North West Territories. This was the first incorporated hospital in the Province. It contained three general wards of 6 beds each and 4 private wards. Part of the upper floor was assigned to the matron and her assistant; the other portion was intended for infectious cases, but it was more often used for maternity and if an infectious case came in it was accommodated in the basement. The medical superintendent was Dr. Albert Olver. He was assisted by Dr. J. G. Calder. Both were graduates of the Manitoba Medical College.

Dr. Olver graduated in 1887 and was soon initiated into the arduous duties of a doctor on construction, a task that called for untiring energy and great ingenuity to cope with the variety of surgical emergencies incident to railway building. He died on August 30, 1891 in the thirty-first year of his age.

Dr. Calder became superintendent on the death of Dr. Olver. He graduated in 1889 and at once entered the service of the C.P.R. In a few months he was an assistant in Medicine Hat, the town that Kipling asserted "had all hell for its basement" because of its natural gas supplies. He was an admirer of A. H. Ferguson of Winnipeg who later was an outstanding surgeon of Chicago. He died in 1909 while travelling in California.

Few facts about the early doctors are available, but the notes of one of the first nurses

supply some interesting side lights of the hospital and its work. Miss E. Birtles, a graduate of the first class of the Winnipeg General Hospital became assistant to the matron, Mrs. G. Reynolds, a graduate of Leeds Infirmary. Miss Birtles writes:

"This being the only hospital between Winnipeg and Victoria patients came from long distances—Golden, Edmonton, Calgary, Macleod, Lethbridge, Grenfell, Prince Albert, Saskatoon and many intervening points of the C.P.R. A greater number of the patients were railway men and a greater part of the work was surgery. Dr. Calder was a clever surgeon.

"At major operations the two doctors did the work, the matron gave the anaesthetic and the assistant was 'scrub up' nurse. The sterilizing of dressings, towels and instruments was done on the kitchen stove in saucepans and steamers as sterilizers were unknown at that time, at least as far as the North West Territories was concerned.

"On one occasion an elderly man came in from Grenfell suffering from some abdominal trouble, the symptoms seeming to point to intestinal obstruction. It was decided to operate and they found a double intussusception about twelve inches apart which was removed. There was no Murphy's button at their command so the ends of the intestine were sutured together and during the process the patient showed signs of collapse, everything had to be dropped and all attention given to reviving him. He soon rallied and after all washing and scrubbing preparations had been gone through again, the operation was completed. This had taken place in an empty room on the upper floor which he was to occupy. The assistant nurse was to stay and special him day and night for the first three days until he began to show signs of a steady improvement. Dr. Calder would come up to relieve the nurse for a half hour occasionally, but as to sleep she got what she could sitting in a rocker with a string attached to her wrist and the patient's which he promised to pull if he needed anything. He made a splendid recovery. . . ."

Typhoid fever was the most common disease that required medical attention and it is not to be wondered at that the nurses should contract it. Even the doctors were not immune and a few years later, in 1895, Dr. John Barker Peters after only eleven months incumbency in the office of Medical Superintendent succumbed to it at the age of twenty-six.

CALGARY

The first medical reference to Calgary is in the diary of the first Assistant Surgeon of the Mounted Police, Richard Barrington Nevitt. He was then stationed at Fort Macleod. On March 18, 1877, he wrote:

"The kits, arms, stores and everything inspected. The hospital looks well. Lauder seems to have pretty nearly all he requires. He handed me a list of things absolutely required."

Dr. John Drought Lauder was a veterinary surgeon who came from Ireland. After studying medicine in Liverpool, England, for three years, he came to Canada and in 1886 became a Hospital Sergeant at the Northwest Mounted Police Hospital. He was later transferred to Calgary.

In February, 1882, the *Macleod Gazette* reported that Staff Sergeant De Veber arrived at Fort Macleod from Fort Walsh and was leaving for Calgary to act as hospital steward for the Mounted Police. Dr. Leverett George De Veber graduated in 1870 from the University of Pennsylvania. For several years he was connected with the service of the Northwest Mounted Police. In 1882 he was stationed in Calgary. Three years later he established a private practice in Macleod where he remained for five years when he settled in Lethbridge. During the Rebellion of 1885 he served as Surgeon in the Rocky Mountain Rangers.

Elected a member of the legislative assembly of the Northwest Territories in 1898 he served until 1905. When the Province of Alberta was created in that year he entered the Alberta Government as Minister without portfolio. Appointed a senator in 1906 he was Chairman of the Committee on Public Health, and took an active part in the larger affairs of Canada.

About the first of February 1883, Dr. G. A. Kennedy left for Calgary, where he was to be stationed for a while. Staff Sergeant De Veber took his place at Fort Macleod.

On April 4, 1883, the following note appeared in the *Macleod Gazette* in reference to the Calgary hospital:

"The new hospital is now open. It is comfortable, large and well lighted, one of the best in the country."

On June 14, 1883 one finds this item again referring to Calgary:

"Dr. Henderson has arrived and taken up his quarters at A. W. McVittie's residence. The doctor was formerly house surgeon at the Montreal General Hospital, and the large experience gained as such eminently fits him for the field of labour he has undertaken."

Dr. Andrew Henderson referred to here was the first civilian practitioner in Calgary. He died a few years ago at Powell River, B.C. He wrote:

"Left for the North West about 1883, arriving at the end of the track ten miles from Maple Creek (Sask.) en route to Calgary, Dr. Mewburn having already assumed the duties of medical superintendent at the Winnipeg General Hospital during the Fall of 1882. The journey from the end of the track to Calgary was made by cayuse in spells, and occupied the following six weeks, fording the Saskatchewan at Medicine Hat and the Bow River at Calgary. I arrived at Calgary on June 8, 1883 and at once located on the East side of Elbow river near the old Hudson's Bay Fort."

In May 1884 he was appointed acting assistant surgeon of the Police for Calgary in which capacity he served until 1887. In this year he moved to St. Paul, Minn., but returned in 1889 for the C.M.A. meeting at Banff. He later moved to the coast.

When Calgary sought nursing assistance for its first General Hospital, Miss Birtles of Medicine Hat responded and gives many interesting reminiscences of her pioneering there. Previous to her arrival, a small house on the Bow river had been used as a hospital with Mrs. N. Hoade in charge. The building had a door punctured by bullets and a few years previously had been used for immoral purposes. It was arranged to hold eight patients.

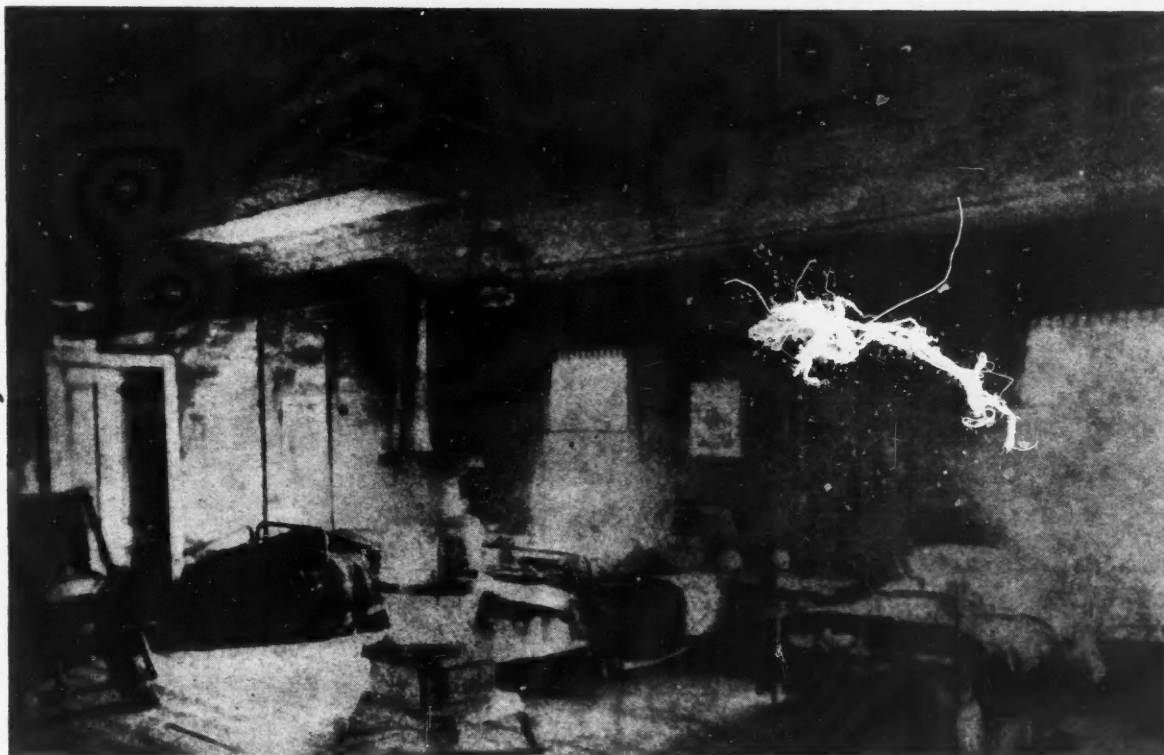


Fig. 1.—Interior of first hospital at Calgary, R.N.W.P. barracks grounds. Taken 1884.

It is said that Mrs. Hoade's ideas of sterilization were rather crude. She had a basin of carbolic solution in the entrance hall. All doctors coming into hospital were supposed to disinfect their hands on their arrival. What they did after that did not matter much. Her husband who acted as orderly and general factotum saw to it that the patients took the medicine ordered. For the more obstinate ones he held the threat of turning them over to the local undertaker for treatment.

Sometimes there were more than eight patients; the extra ones stowed wherever a bed could be placed. On one occasion they were in the corridor or in the room where meals were eaten. The latter could scarcely be called

The surgical instruments of the hospital consisted of a probe, one pair of scissors and one dressing forceps. One mackintosh and a winchester of carbolic acid solution completed the operating room equipment. No towels, gowns, aprons or gloves were available. The doctor had to supply these as well as instruments, suturing material and whatever else he required.

Typhoid fever patients outnumbered all others in this as well as in all early Alberta hospitals.

The only assistance provided was an orderly and a woman who was supposed to help with the nursing and do the cooking and laundry work as well.

When a trained nurse was asked for, the Board demurred at first as it might prove too expensive, thinking they might have to pay as much as \$15.00 or \$20.00 a month. As the work proved too exacting for the matron who was receiving \$400 a year, the Board finally acceded to the request and a nurse was engaged at \$25.00 a month. Better service was thus afforded the patients and the few doctors in practice in Calgary.

One afternoon on August 14, 1883, the first construction train pulled into Calgary. On the rear platform sat Dr. R. G. Brett, and Dr. N. Lindsay. The former shortly after moved to Banff where he was to remain for many years and take an active part in medical politics in Western Canada.

Dr. Neville James Lindsay was born near London, Ontario, in 1845. He attended Trinity College, Toronto and McGill University and finally graduated in 1874 from Trinity. He practiced at Watford for eight years before leaving for the west. At this time Calgary had the appearance of a boom town. Dr. Lindsay said:

"Calgary in 1883 was principally a canvas town, situated along the eastly bank of the Elbow River, near its mouth. In addition to this, there are a few log buildings in the vicinity comprising the I. J. Baker & Co.'s stores, the Hudson's Bay stores, Jack Ellis' restaurant, a barber shop and a few other shacks. The Royal Hotel doing business under a striped canvas tent, was then the leading public house."

In the year 1886 Dr. Lindsay was appointed by the Government to look after the health of the Blackfoot, Stoney and Sarcee tribes of Indians residing on their reserves near Calgary. He received a C.P.R. appointment over two divisions of the road, extending from Gleichen to Donald on the main line, and an appointment as honorary surgeon to the North West



Fig. 2.—View of part of R.N.W.P. barracks, taken 1884.
X marks the hospital building.

a dining room, for it had to serve as an operating room and the extension table for the operations. This entailed difficulties because of the width of the table.

Miss Birtles became matron after four years of Mrs. Hoade's unconventional nursing. The new matron said that it was very difficult working under the conditions that prevailed then. Patients came and went as they pleased, to ask permission never occurred to them. When one patient was remonstrated with, he said, "show me your rules". Of course there were none to show. Before long a code of rules was adopted and a copy placed in each room.

Mounted Police stationed in Calgary. In 1898 at the age of 53 he undertook the hazardous trip over the White Pass to the Yukon. Other trips into the wilds of British Columbia were undertaken in search of gold and copper claims. After twenty-five years of strenuous general practice he retired in 1908. Many and arduous were the trips he made in saddle and by buckboard to give service and inspire hope and courage to the ranchers of the prairie and foothills. In those early days patients often rode a distance of a hundred miles to consult him. He died in 1928 at the age of eighty.

Another early practitioner of Calgary was E. H. Rouleau. Born at Isle Verte, Quebec, in 1843 and receiving his medical degree from Laval in 1870 he practised for a short time at Ottawa, Quebec, and several other places before moving to Battleford, Sask. in 1884. Three years later he arrived in Calgary. Here he remained until his death in 1912.

Several other doctors resided for short periods during the 'eighties. Among these was John Aiken Sweat, a graduate of Bowdoin College, Maine, in 1880. He reached Calgary with the C.P.R. in 1883, and remained there or followed the railway on construction. He died in 1930 in the United States.

Dr. James Henry Tofield practised for a year or two in Calgary in the late 'eighties. Dr. Tofield was born in Yorkshire in 1848. Upon graduation from Oxford he demonstrated anatomy in Cook's College in Dublin. After serving for a time in India, he returned to England in 1882 and shortly afterwards came to Canada. During the Rebellion of 1885 Dr. Tofield attended a few wounded in Edmonton who had been brought up the river from one of the skirmishes in Saskatchewan. From Calgary he moved to the Tofield area where he served a large district until his death. The town of Tofield was named after him.

BANFF

Railway surveyors discovered the hot springs at Banff. On the arrival of construction Dr. R. G. Brett became interested in the springs, had the water analyzed and dreamed a dream of a great spa similar to those in Europe. This dream was never quite realized, but Banff Springs did during his life become world famous as a mountain resort. Robert George Brett was born at Strathroy, Ontario in 1851. He graduated from Victoria College, Cobourg in 1874 and after several years' practice and postgraduate work in the east, settled in Winnipeg. A short time later he was associated with others in the founding of the Manitoba Medical College. In this institution he was Professor of Materia Medica and Therapeutics and later occupied the chair of Gynaecology and Obstetrics. Joining the C.P.R. as a surgeon on construction, he travelled west.

In 1883 he reached Calgary. As the line passed beyond the Rockies Dr. Brett settled in Banff. For nearly forty years practice and politics kept him busy.

Dr. Brett was elected to the first Legislative Assembly of the North West Territories in 1888. He was president of the Executive Council of the Northwest Territories from 1889 until 1891. He served on the Senate of the University of Alberta from 1908 till 1912. He was a member of the Council of College of Physicians and Surgeons from 1889 until 1906 when the Province of Alberta came into existence. Appointed Lieutenant-Governor of Alberta in 1915, he held this post until 1925. Death took place in September 1929 at the age of seventy-eight.

Dr. Brett was a man of strong opinions and strong political sympathies, but he never allowed these to interfere with his personal friendships. Numerous stories which illustrate the many sides of his personality have been related. He was never on time and was in the habit of telephoning to the Banff Station to have the train held for him. He and Dr. Goodsir McKid, who was president of the C.M.A. in 1912, took a trip abroad and the latter remarked on his return that his most interesting experience was that of being in a country where no train could be held for Brett.

On one occasion when he was campaigning against the Hon. Arthur Sifton, a joint meeting was held. As usual Brett was late and when Sifton had concluded his speech he announced to the audience that he knew exactly what Brett was going to say and that he would deliver Brett's speech for him, which he proceeded to do. During the course of it Dr. Brett entered and applauded vigorously saying that Sifton could explain Conservative politics better than he could himself.

Dr. Brett was known to many old timers who in some instances had worked on railroad construction. While Lieutenant-Governor it was announced in the Peace River district that the Lieutenant-Governor was to make a visit. A well known trapper tramped in from Fort Vermilion to see this wonderful person. When the Lieutenant-Governor stepped from the train, the old trapper took a good look at him and then exclaimed: "Oh, Hell! It's only old Doc Brett". The doctor thoroughly enjoyed the joke on himself.

Dr. Brett did much for the medical profession in Saskatchewan and Alberta as a member of the College of Physicians and Surgeons and as a member of the Council of the North West Territories. He was genial, big hearted and ever ready to assist other practitioners in their difficulties.

MEDICAL SOCIETIES

On August 13 and 14, 1889, the 22nd Annual meeting of the Canadian Medical Association

was held in Banff. Dr. G. A. Kennedy of Macleod read a paper on "The Climate of Alberta".

The meeting was of special interest since it was the first medical gathering held in the future province and it saw the birth of the North West Territories Medical Association. The first officers of this organization were: *President*—Dr. G. A. Kennedy, of Fort Macleod; *Vice-president*—Dr. R. G. Brett, of Banff; *Secretary-Treasurer*—O. C. Edwards, of Fort Macleod.

The following were the original members: Drs. G. A. Kennedy, H. T. MacInnes, E. H. Rouleau, F. W. Mewburn, A. Olver, Rutledge, C. S. Haultain, R. G. Brett, R. B. Cotton, O. C. Edwards.

At the second annual meeting held in Medicine Hat the Presidential address by Dr. G. A. Kennedy is of particular interest to us since it recalls pictures of the conditions under which practice was carried on over fifty years ago in Alberta.

Let me quote from Dr. Kennedy's paper:

"Our beginning is small, but it reflects credit to us, that we have been able to make a beginning at all. When we reflect that Manitoba, with its metropolitan city, its medical college, its population, dense as compared to ours, and its easy means of communication between parts of a province infinitely smaller than our territory, was only last spring able to form an Association, we have, I say, every reason for self-glorification in having justly earned the title of the premier Medical Association of Western Canada. Our beginning is small, I repeat, but who will say that we cannot look forward with confidence to the time when the North West Territories Association will be the parent organization of numerous city, country, and provincial Associations, all formed and carried on for the same purpose—the intercommunication of ideas, the scientific discussion of medical and surgical subjects, and the elevation, generally, of our noble profession."

Dr. Kennedy alluded to a circular sent out by the secretary the year before announcing the formation of the Association.

"A stimulus will thus be given to men working alone to keep accurate temperature charts, and notes of the disease prevailing, and also to keep and present post-mortem specimens. A hazy idea seems to prevail as the nature of that fever which has been given local names as Red River, Saskatchewan, Northwest and Mountain. If members would keep careful charts, and where possible, make post mortem examinations, at our next meeting profitable discussions would be elicited and possibly a more satisfactory opinion expressed as to its true nature. Typhomalaria is also a name sometimes given to it. Is that correct or is it a modified form of typhoid?"

A resolution was passed calling on the government to provide suitable accommodation for the insane of the North West who were confined in Mounted Police guard rooms or gaols sometimes for months only at last to be sent to the penitentiary in Manitoba. The president made a plea for better sanitation in the many villages that were beginning to dot the western prairies.

This association was the forerunner of the Alberta Medical Association and the various city and district societies.

Since this article is restricted to the 'eighties no space can be allotted to many doctors in Medicine Hat, Calgary, and Banff who arrived in the early 'nineties. Dr. H. G. McKid, R. D. Sanson, and George MacDonald are among these.

At this period there was nothing spectacular in Alberta medical development. Most of the doctors were young and came with the Mounted Police or the C.P.R. They were unhampered by traditions and meagrely equipped, yet they laid well and truly the foundations of medicine in the Province.

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1. JAMIESON, H. C.: *Canad. M. A. J.*, 20: 188, 1929.
2. *Ibid.*: 29: 451, 1933.
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ASSOCIATION NOTES

The Annual Meeting at Banff June 10 to 14, 1946

We would, first of all, remind all the members of the Association who intend to come to this meeting, of certain details, set forth in previous issues of the *Journal*.

1. Get your application and reservations in *at once*. These are coming in rapidly, and assignments are being made in the order of application.

The Housing Committee tells us that the number of 1,070 to 1,100 *will not be exceeded*: and already space is beginning to become limited. So do not wait.

2. The rates at Banff Springs Hotel will be \$11.00 a day for each person, American plan. Other hotels will be somewhat less and rates may be obtained from them. See the *Journal* of January and February for details.

3. Nobody will have a room to himself, except in the case of a few special exceptions. Rooms must be shared. Members may arrange between themselves to pair off. All rooms are good. All have bathrooms.

4. Banff Springs Hotel is a world-famous summer resort, and has every kind of entertainment and sport available. Bring your golf clubs, or tennis racquet, or hill-climbing shoes. Bring your cameras, colour or plain, or motion-picture type.

5. A most attractive program for ladies has been arranged, and we note with great pleasure that Jan Cherniavsky, a pianist of international renown, is to give a concert. He

is a marvelous player, and to hear him play is an experience that will leave a deep impression.

We are continuing in this number our brief travelogue of British Columbia. No Province affords a more attractive field for a holiday, especially in June.

* * *

Central British Columbia is an interesting division of this Province, from many points of view. First, historically: as it includes the territory which once was the centre of one of the biggest gold rushes in North American history—the Cariboo gold rush. The history of this goes back to 1850 or thereabouts, when gold was discovered in the Cariboo, and from all over the West, treasure-seekers, following one of the strongest of human instincts, the urge for gold, flocked in their thousands to the Cariboo, and overnight great towns grew up, Barkerville, and Ashcroft, and many others. Many of these are now only skeleton towns, and the grass grows in their deserted streets, but in their day they were filled with a turbulent, hard-drinking, hard-fighting throng of lawless men and women. A whole literature has grown up round such mining camps, from Denver to Alaska, and the same legends would fit them all.

A most fascinating chapter of history was written in the Cariboo—some of the most colourful of Canadian personalities were to be met there—amongst the most striking being Sir Matthew Baillie Begbie, first Chief Justice of British Columbia, who introduced and enforced the law and order by the sheer force of his personality and courage in one of the most hopeless and unpromising situations ever known in British territory.

The Cariboo Road is one of the famous roads of the North American continent, and its very name brings back to the old timer memories of excitement and adventure; of stage-coaches carrying passengers; of bull-teams hauling freight; of 100-Mile House, and 83-Mile House, and other stage-stops. Today the Cariboo Road is one of the main motor highways of B.C. and one can travel over a safe, well built road, through one of the loveliest countries in the world, with roadhouses, excellent small town hotels, and campsites all the way along. Today, one passes and is overtaken by huge trucks, thundering on their way from the coast to the interior, to Prince George and all way points, and back again, carrying freight and cargo of every sort, and constituting the best proof that the road is good, and safe for every sort of travel.

One can travel 500 miles on this road straight north from Vancouver to Prince Rupert, thence northwest another 300 miles to Hazelton. Plans are on foot for a road through to the Peace

River, and when this is built, a truly wonderful country will be opened up for direct communication with the Coast. All along the road are opportunities to fish, to explore, to stop and rest and loaf. The logical end of the road for most tourists is at Prince George, a thriving town of 3,000 to 4,000 people, situated on the banks of the Fraser, which is also the commercial, legal and educational centre for a large surrounding country. It has a modern hospital, secondary schools, good shops, a theatre, good garages, and such other amenities of life as a golf course, tennis courts and bathing facilities. For those who want to come in the fall of the year, a vast hunting country is at their disposal. Moose and elk and goat abound, deer and black and grizzly bear. Fishing is, of course, the most universally available of all forms of hunting, and the hundreds of lakes and rivers, large and small, the Fraser and the Striat and the Nechaco, the Parsnip, Pine, and Peace amongst the rivers, with Summit Lake, Strait Lake, McLeod Lake, Quesnel Lake and scores of others, are the habitat of fish of which one dreams, the Rainbow, the Dolly Varden, the Arctic Trout. One may obtain information about all this by writing to the B.C. Government Travel Bureau, Parliament Buildings, Victoria, B.C. But Prince George, while the natural terminus of this trip, and its headquarters, is not the only attraction by any means. Ashcroft, Williams Lake, Quesnel, Wells and Barkerville, 150-Mile House, Vanderhoof, Burns Lake, and many other small towns represent concentrations of population at various places in a huge area of great richness. For Barkerville and Ashcroft and Soda Creek were not the only places where gold was to be found, and all this area, mountainous, and full of creeks and gravel sands, is a potential gold-mine. Ranching, too, and cattle-raising, constitute a more prosaic, but also more reliable, source of wealth, and vegetables and fruit are grown in this country which are equal to any. The Ashcroft potato is known for its standard of excellence.

Also from Prince George one can get easily to Prince Rupert via Hazelton, and to Jasper and so to Edmonton. Through Prince Rupert one can travel to catch the boat from that city to Vancouver, the well-known Inside Passage.

The Okanagan Valley of B.C. covers a wide area, and includes most of the fruit-growing part of British Columbia. It is also a big lumbering area, and in its eastern part are many mines of great value: silver, lead and zinc are chiefly mined here, while copper and gold are also obtained. As one journeys further east, one comes into the Kootenay District, and further east there are the coal mines of Fernie and the Crow's Nest, before one crosses the provincial boundary into Alberta.

One reaches the Okanagan most easily by rail from Vancouver, via Kamloops. All along the way one passes through some of the greatest

hunting and fishing country in the world. Bear, black and grizzly, deer, sheep, elk, are among the heavier game, while grouse, pheasant, ducks and geese abound. All lakes and streams, and they are many, give excellent fishing.

The great Okanagan Lake is the centre of this area. It is a long narrow lake, some 80 miles or more in length, and along its banks are situated most of the chief towns of the Okanagan. Vernon, Kelowna, Peachland, Penticton, West Summerland, Naramata, are the main centres of population in this rich country.

It would be invidious to pick out any special town for detailed description. Each of these towns is a centre, where commercial, legal and professional facilities are concentrated. Education and health are represented by good schools, good hospitals, well-equipped health centres and so on. Each town has its particular attractions, Penticton, at the southern end of the lake, has a wonderful series of beaches, safe for children, and delightful for all ages. Kelowna, in the middle, has its Aquatic Club and its regatta. Vernon, at the north end, is a little way from the lake, has excellent hotels, and large tourist camps, and has golf courses (for the matter of that, so have the other cities named) tennis and boating. Pheasant shooting in the fall is rated the best on the continent in the Vernon District.

The climate of this valley is almost Arcadian in its quality, if one can believe the meteorological records, not to say the accounts given by those who live in the Okanagan. The summers and autumns are particularly delightful. The winters are never severe, but the weather is sunny and bracing. Skiing is developed in this area to a high degree, and Penticton, Kelowna, and Vernon afford every opportunity for this sport. It is a wonderfully healthy country, and is the winter as well as the summer resort for people living on the coast of British Columbia.

The chief activity of the Okanagan is, perhaps, its orchard industry. To drive or travel through this country anywhere from spring till fall, is a revelation of apple and other orchard farming. In the spring, there is the wonderful beauty of blossom-time, apple and peach (the Okanagan peaches are famous everywhere) and pear and plum, with cherries and apricots. Then the ripening fruit keeps up a ceaseless flow of activity in picking, preserving, jam-making, packing and so on. All through the valley are canneries and packing-houses, dehydrating and processing plants. During the war, enormous quantities of fruit and fruit products were shipped from this valley, to our troops overseas, and to Britain for the use of the civilians.

An experimental farm is maintained by the Dominion government at Summerland, and is of enormous value to the district.

Other crops are also grown, melons for example. The Oliver cantaloupes are famous for their flavour and other qualities: while tobacco grows well here and is a major crop. Grape-

growing and wine-making, too, constitute one of the most important of the Okanagan's industries, and Kelowna particularly has given its name to a series of wines of excellent quality and bouquet.

As we leave the Okanagan, and journey eastward, we come to the Kootenay and the Boundary country, the latter to the south, with good roads leading into the United States, so that one may take a trip to Spokane, Seattle, Portland and other cities, or go and see the new and magnificent Grand Coulee Dam which impounded the waters of the Columbia and harnesses a power which surpasses that controlled by even Boulder Dam or any other of the great American power projects. It makes a vast lake of the Columbia's upper waters, a hundred and more miles long and opens for settlement and agriculture a vast area of what is now a desert of volcanic ash.

As one journeys east one comes to Nelson and Trail, two important towns. Nelson is one of the oldest towns of British Columbia, and has a most fascinating history. It is the centre of a great mining industry, where lead, silver, zinc and copper are produced in great quantities. Rossland, Grand Forks, and Trail are a short distance away to the south, while Slocan, New Denver, Kaslo to the north and east awakened by their names memories in the old-timer's mind, of mining camps and all that goes with them.

Nelson is a beautiful little city, with a unique golf course up on the hillside. From this course (*experto crede*) one has a view only equalled by that seen from the Capilano Golf Course in West Vancouver. One looks down on a lovely valley, in which nestles the city itself.

It is easy to get to Nelson by car from Alberta, and from Spokane, 42 miles away, it is on the Southern Trans-Canada Highway, and has good hotels, cottages, auto camps, etc., for the use of tourists. From Nelson it is an easy drive to Trail, one of the big smelting centres, where the Consolidated Mining and Smelting Co. has its smelters: big chemical works are also situated here. Rossland is the residential centre for those who work in Trail.

And so one can go on, eastward through Creston, Cranbrook, Kimberley, all mining centres. From Kimberley, one can go north by a good road to Banff itself, south to Idaho. Then one comes to Fernie and the Crow's Nest and so to Alberta, through a country of coal mining.

TRANS-CANADA AUTOMOBILE TRIP

Following the route of the Trans-Canada highway from the Atlantic coast, the motor tourist may travel westward for more than 1,700 miles over improved highways to Sault Ste. Marie, Ontario, and then by steamer to Port Arthur or Fort William. From there the Trans-Canada route leads westward to Vancouver, a motoring distance at present of approximately 2,000

TRANS-CANADA HIGHWAY MILEAGE TABLE (Approximate)

Route No.		Distance between points	Highway mileage from Halifax	Highway mileage from Vancouver
2	Halifax, N.S.	0		3,779
2 to	Truro, N.S.	63	63	3,716
4	Glace Bay, N.S.	0		3,930
4 to	Sydney, N.S.	13		3,917
4 to	Truro, N.S.	201		3,716
2 to	N.S.-N.B. Bdy.	96	159	3,620
2 to	Aulac, N.B.	1.4	161	3,618
2	Charlottetown, P.E.I.	0		3,702
2 to	Port Borden, P.E.I.	52		
Ferry	Cape Tormentine, N.B.	9		3,650
16 to	Aulac, N.B.	32		3,618
2 to	Moncton, N.B.	35	196	3,583
2 to	Sussex, N.B.	49	245	3,534
2 to	Saint John, N.B.	45	290	3,489
2 to	Fredericton, N.B.	94	384	3,395
2 to	Edmundston, N.B.	176	560	3,219
2 to	N.B.-Que. Bdy.	11	571	3,208
2 to	Riviere du Loup, Que.	67	638	3,141
2 to	Levis, Que.	119	757	3,022
Ferry or bridge to	Quebec, Que. (Ferry, 1 mile; Bridge, 13 miles)			
2 to	Trois Rivieres, Que.	83	840	2,939
2 to	Montreal, Que.	96	936	2,843
8 to	Lachute, Que.	49	985	2,794
8 to	Hawkesbury, Ont. (Que.-Ont. Bdy.)	17	1,002	2,777
17 to	Ottawa, Ont.	62	1,064	2,715
17 to	Pembroke, Ont.	99	1,163	2,616
17 to	Mattawa, Ont.	91	1,254	2,525
17 to	North Bay, Ont.	40	1,294	2,485
	Junction—Highway to Cochrane—271 miles.			
17 to	Sudbury, Ont.	83	1,377	2,402
17 to	Espanola, Ont.	48	1,425	2,354
	Junction—Highway to Little Current, Manitoulin Island—35 miles			
17 to	Sault Ste. Marie, Ont.	154	1,579	2,200
Steamship	Port Arthur } Ont.	250		
Ferry to	Fort William } ..		1,579	2,200
17	Port Arthur, Ont.		1,579	2,200
17 to	Fort William, Ont.	5	1,584	2,195
17 to	Dinorwic, Ont.	204	1,788	1,991
17 to	Kenora, Ont.	104	1,892	1,887
17 to	Ont.-Man. Bdy.	33	1,925	1,854
1 to	Winnipeg, Man.	113	2,038	1,741
1 to	Portage la Prairie, Man.	58	2,096	1,683
1 to	Brandon, Man.	84	2,180	1,599
1 to	Man.-Sask. Bdy.	87	2,267	1,512
1 to	Indian Head, Sask.	123	2,390	1,389
1 to	Regina, Sask.	50	2,440	1,339
	Junction—Route No. 11 to Saskatoon—196 miles.			
1 to	Moosejaw, Sask.	46	2,486	1,293
	Junction—Route No. 2 to Prince Albert, 231 miles; to Prince Albert Park—267 miles.			
1 to	Swift Current, Sask.	123	2,609	1,170
1 to	Maple Creek, Sask.	101	2,710	1,069
1 to	Sask.-Alta. Bdy.	27	2,737	1,042
2 to	Medicine Hat, Alta.	34	2,771	1,008
2 to	Bassano, Alta.	107	2,878	901

Route No.		Distance between points	Highway mileage from Halifax	Highway mileage from Vancouver
2 to	Calgary, Alta.	87	2,965	814
	Junction—Route No. 1 to Edmonton—201 miles.			
	Jasper Park—405 miles			
2 to	Banff, Alta.	85	3,050	729
1 to	Windermere Hy. Jct., Alta.	18	3,068	711
1 to	Lake Louise, Alta.	19	3,087	692
	Junction—Route No. 1A—149 miles to Jasper via Banff-Jasper Highway.			
1 to	Alta.-B.C. Bdy.	4	3,091	688
1 to	Golden, B.C.	50	3,141	638
1 to	Revelstoke, B.C.	192	3,333	446
1 to	Salmon Arm, B.C.	78	3,411	368
1 to	Kamloops, B.C.	76	3,487	292
1 to	Cache Creek, B.C.	55	3,542	237
1 to	Ashcroft, B.C.	6	3,548	231
1 to	Spence's Bridge, B.C.	29	3,577	202
1 to	Lytton, B.C.	24	3,601	178
1 to	Hope, B.C.	73	3,674	105
1 to	Vancouver, B.C.	105	3,779	0
Ferry to	Victoria, B.C.	72		
1	Vancouver Island Highway.			

Highway Mileage—Halifax to Vancouver. 3,779
 Boat Ferry—Sault Ste. Marie to Port Arthur and Fort William. 250

Total Distance—Halifax to Vancouver. 4,029

miles, passing through Kenora in Ontario; Winnipeg and Brandon in Manitoba; Regina, Moose Jaw and Maple Creek in Saskatchewan; Medicine Hat, *Calgary and Banff in Alberta*; to Golden in British Columbia. A highway about 192 miles in length between Golden and Revelstoke, following the "Big Bend" of the Columbia River, has been recently completed. From Revelstoke the motorist may continue through Salmon Arm, Kamloops and Lytton to Vancouver and then by boat to Victoria and other points on Vancouver Island.

While the above is largely the most direct route it is by no means the only one. Alternative routes lead through areas the physical attractions of which are well worth the extra mileage. Passing through Ontario, a southerly route follows the St. Lawrence River and the shores of Lake Ontario to Toronto, then swings north through the celebrated Highlands of Ontario to North Bay, and then west to Sault Ste. Marie. Steamer connection can be made to Fort William or Port Arthur. Continuing on by way of Kenora and Winnipeg the route leads across the prairies as described above to Medicine Hat, Alberta. Here the motorist may continue by the southerly route through Lethbridge and Macleod in Alberta and by way of the Crow's Nest Pass to Cranbrook in British Columbia; or he may swing northwest to Calgary and

Banff, and then down the Windermere road to Cranbrook and continue by way of Nelson, Princeton, Lytton and down the picturesque Fraser Valley to Vancouver in British Columbia, or he may take the delightfully scenic route which is only a little less direct, via Penticton and the Okanagan Valley to Salmon Arm on Shuswap Lake, and thence to the coast via Kamloops and the spectacular Fraser Canyon.

The Trans-Canada highway during the usual touring season of the year has numerous advantages over other trans-continental highways. Climatically it is the only one, sections of which are not tropically hot during the summer time. It does not traverse long stretches of desert, alkaline wastes and bad lands. In scenic beauty it is unrivalled by any other highway which spans the continent.

PROVISIONAL LADIES' PROGRAM

MONDAY, JUNE 10

12.30 p.m.—A buffet luncheon is being arranged at the Golf Club House for the wives of the members of Executive and of General Council.

Afternoon.—Registration.

Evening.—Chamber music, dancing.

TUESDAY, JUNE 11

Registration throughout the day.

Afternoon.—Golf and other recreations.

7.30 p.m.—Dinner for all medical men and their wives, followed by a program arranged by the British Columbia Division of the Canadian Medical Association. Dinner will be served in the Alhambra Dining Room and in the Fairholme Dining Room.

WEDNESDAY, JUNE 12

9.00 a.m.—Registration.

Ladies' Golf Competition.

This day will be free for recreation—golf, riding, swimming, tennis, walking. Also for private motor trips which can be arranged at Brewster's Transport Desk in the hotel lobby.

Busses will leave the Hotel at intervals for Banff Village.

8.30 p.m.—Ceremonial Meeting in the Ball Room, and Piano Recital by Jan Cherniavsky, followed by the President's Reception in the River-view Lounge.

THURSDAY, JUNE 13

a.m.—Completion of Ladies' Golf Competition.

2.00 p.m.—Drive to Buffalo Park, thence to Tunnel Mt. Road, with views of Bow Falls, Spray Valley, returning by Cave and Basin and Cascades of Time.

Evening.—Chamber music, movies or bridge.

FRIDAY, JUNE 14

a.m.—Free for recreation.

3.30 p.m.—Afternoon Tea. Mrs. Wallace Wilson At Home to all the ladies in the Riverview Lounge.

8.00 p.m.—Twilight Drive (following early dinner) to the evening haunts of the beaver and the bear.

9.30 p.m.—Grand Final Dance and presentation of Golf Prizes.

PRELIMINARY PROGRAM SEVENTY-SEVENTH ANNUAL MEETING OF THE

Canadian Medical Association

TO BE HELD IN THE BANFF SPRINGS HOTEL, BANFF, ALBERTA
JUNE 10, 11, 12, 13, 14, 1946

<i>President</i>	-	-	-	-	DR. LÉON GÉRIN-LAJOIE, Montreal
<i>President-Elect</i>	-	-	-	-	DR. WALLACE WILSON, Vancouver
<i>General Secretary</i>	-	-	-	-	DR. T. C. ROUTLEY, Toronto

Detailed arrangements for the Seventy-seventh Annual Meeting to be held in Banff during the week of June 10 are proceeding satisfactorily.

General Council will meet on Monday and Tuesday, June 10 and 11.

On Tuesday evening, the members of General Council will be guests of the British Columbia Division.

A series of Round Table Conferences has been arranged for the mornings of Wednesday, Thursday and Friday, from nine to ten o'clock, to be followed by General Sessions.

Sectional Meetings will be held on Wednesday and Friday afternoons.

The Annual General Meeting will be held on Wednesday evening, June 12, commencing at

8.30 o'clock. On this occasion, the retiring President, Dr. Léon Gérin-Lajoie, will hand over the badge of office to his successor, Dr. Wallace Wilson.

Thursday afternoon has been given over to golf and other entertainment.

On the evening of Thursday, June 13, there will be a discussion of health insurance and allied problems, the program of which is being arranged.

OTHER MEETINGS

The British Columbia Division will hold its annual meeting on Tuesday afternoon, June 11.

The annual meeting of the Alberta Division will be held on Tuesday afternoon, June 11.

The Society of Obstetricians and Gynaecologists of Canada will meet on Monday and Tuesday, June 10 and 11.

A reorganization meeting of the Canadian Rheumatic Disease Association will be held on Tuesday, June 11, commencing at two o'clock. All members of the medical profession who are interested are invited to attend.

The annual business meeting of the Canadian Association of Radiologists will be held on Tuesday afternoon, June 11, commencing at two o'clock. The annual dinner will take place on Tuesday evening, followed by a meeting of Council.

The Canadian Society of Allergists will meet on Tuesday afternoon, June 11, commencing at two o'clock.

The Canadian Society of Otolaryngologists will meet on Wednesday, June 12, immediately following the session of the Section of Otolaryngology.

The Canadian Medical Protective Association will hold its annual meeting on Wednesday, June 12, at 4.30 p.m.

The Canadian Urological Association will hold two executive sessions immediately following the meetings of the Section of Urology on Wednesday and Friday afternoons, June 12 and 14.

The members of the Federation of Medical Women of Canada are asked to note the following:

1. There will be an Executive Luncheon on Friday, June 14, at 12.30 o'clock, in the Banff Springs Hotel.
2. The Annual Dinner of the Federation will be held at 7.00 p.m. on Friday, June 14, in the Golf Club House, Banff.

The Canadian Ophthalmological Society will meet on Friday, June 14, commencing at nine o'clock in the morning and continuing throughout the day.

The Canadian Society for the Study of Diseases of Children will meet on Friday evening, June 14, at seven o'clock, continuing on Saturday morning, June 15.

SCIENTIFIC PROGRAM

Wednesday, June 12

ROUND TABLE CONFERENCES

9.00 - 10.00 a.m.

Dermatology and Medicine

Chairman: Dr. H. A. DesBrisay, Vancouver.
Subject: *Inflammatory Nodular Lesions of the Extremities.*

Obstetrics and Gynaecology

Chairman: Dr. Murray Blair, Vancouver.
Subject: *Hæmorrhage in the Last Trimester of Pregnancy.*

Wednesday, June 12—Continued

Otolaryngology and Ophthalmology

Chairman: Dr. J. A. Smith, Vancouver.
Subject: *Retrobulbar Neuritis.*

Pædiatrics

Chairman: Dr. R. P. Kinsman, Vancouver.
Subject: *Acute Infectious Gastro-enteritis.*

Psychiatry

Chairman: Dr. G. A. Davidson, Vancouver.
Subject: *Teaching Standardization.*

Radiology

Chairman: Dr. Andrew Turnbull, Vancouver.
Subject: *Radiological Diagnostic and Therapeutic Problems.*

Surgery

Chairman: Dr. A. B. Schinbein, Vancouver.
Subject: *The Benefit of Experience in Treating War Wounds as Applied to Civilian Practice.*

GENERAL SESSION

Wednesday, June 12

10.15 a.m.

Dr. B. J. Harrison, Vancouver.
Radiology and the General Practitioner.

Dr. Léon Gérin-Lajoie, Montreal.
Valedictory Address.

Dr. Leonard Parsons, Birmingham, England.
The Blackader Oration.

SECTIONAL MEETINGS

2.15 p.m.

Wednesday, June 12

Section of Anæsthesia

Dr. D. D. Freeze, Vancouver.
Spinal Anæsthesia.

Dr. H. J. Shields, Toronto.
Anæsthesia in Chest Surgery.

Dr. B. C. Leech, Regina.
Safety Measures in the Practice of Anæsthetics.

Section of Historical Medicine

Dr. C. G. Campbell, Vancouver.
Lucretius and Greco-Roman Medical Philosophy.

Dr. P. A. C. Cousland, Victoria.
Early Medicine in Vancouver Island.

Dr. G. E. Kidd, Vancouver.
An Exhibit of Osteological Specimens Pertaining to B.C. Indians.

Dr. E. P. Scarlett, Calgary.
Delta: A Problem in Authorship.

Wednesday, June 12—Continued**Section of Industrial Medicine**

- Dr. W. N. Kemp, Vancouver.
Some Psychosomatic Aspects of Recovery from Accidental Injury in Industry.
- Dr. J. G. Cunningham, Toronto.
Industrial Health Problems Encountered During the War.
- Dr. G. F. Amyot, Victoria.
Industrial Health.
- Dr. R. Vance Ward, Montreal.
What is the Future of Industrial Medicine?
- Dr. M. R. Basted, Trail, B.C.
The Treatment of Commoner Diseases in Industry.

Section of Medicine

- Dr. H. E. Rykert, Toronto.
The Present Status of Penicillin in the Treatment of Sub-acute Bacterial Endocarditis.
- Dr. W. W. Simpson, Vancouver.
The Management of Emergencies in Diabetes Mellitus.
- Dr. E. S. Mills, Montreal.
Vascular Changes Which Affect Prognosis and their Therapy.
- Dr. W. J. Deadman, Hamilton.
Sudden Death.

Section of Obstetrics and Gynæcology

- Dr. F. S. Hobbs, Vancouver.
Gonorrhœa in the Female.
- Dr. N. W. Philpott, Montreal.
The Significance of the Rhesus Factor in Obstetrics.
- Dr. W. R. Foote, Montreal.
A Study of the Obstetrical Pelvis.
- Dr. William Leonard, Trail.
Difficult Labour.

Section of Ophthalmology

- Dr. J. A. McLean, Vancouver.
Visual Field Changes in Syphilis of the C.N.S.
- Dr. Allan R. Anthony, Vancouver.
Low Pressure Glaucoma.
- Dr. M. R. Levey, Edmonton.
Intraocular Tumours.
- Dr. J. T. Cruise, Winnipeg.
Intra-capsular Cataract Extraction.
- Dr. John A. Irving, Vancouver.
Tuberculin Therapy.

Section of Otolaryngology

- Dr. R. Scott-Moncrieff, Victoria.
Penicillin in the Treatment of Nasal Sinus Disease.
- Dr. Arthur W. Proetz, Saint Louis, Missouri.
Reliability of Radiological Evidence of Sinus Disease.
- Dr. H. W. D. McCart, Toronto.
The Surgical Treatment of Carcinoma of the Larynx.

Wednesday, June 12—Continued**Section of Pædiatrics**

- Dr. Douglas B. Leitch, Edmonton.
Infant Feeding—Western Style.
- Dr. J. R. Neilson, Vancouver.
Malformations of the Gastro-Intestinal Tract in the Newborn, Requiring Early Surgical Treatment.
- Dr. S. Graham Ross, Montreal.
Infectious Hepatitis in Childhood.
- Dr. J. H. B. Grant, Vancouver.
Immunization of Children.

Section of Psychiatry

- Dr. G. A. Davidson, Vancouver.
Psychomotor Epilepsy.
- Major W. D. Ross, Overseas.
Psychiatry in Canada.
- Dr. Lorne D. Proctor, Toronto and
Dr. K. G. McKenzie, Toronto.
The Use of Bilateral Frontal Leucotomy in the Treatment of Psychiatric Abnormalities.
- Dr. C. M. Hincks, Toronto.
The Future of Psychiatry in Canada.

Section of Radiology

- Dr. C. G. Campbell, Vancouver.
Gastro-Intestinal Examinations, Particularly of the Duodenum.
- Dr. Jules Gosselin, Quebec.
Comparative Studies of X-Ray Aspects of Miliary and Nodular Shadows of the Lungs.
- Dr. A. W. Blair, Regina.
Some Aspects of Malignancy.
- Dr. Arthur E. Childe, Winnipeg.
Bone Lesions Encountered During Infancy.

Section of Surgery

- Dr. Don Starr, Vancouver.
Principles Underlying Reduction and Nailing of Fractures of the Neck of the Femur.
- Dr. J. A. MacFarlane, Toronto.
Lessons Learned in War Which are Applicable to Civilian Practice.
- Dr. Hamilton Baxter, Montreal and
Dr. Fred Smith, Montreal.
The Effect of Penicillin and Streptomycin on the Take of Skin Grafts.
- Dr. K. R. Trueman, Winnipeg.
Esophageal Hiatus Hernia, Diagnosis and Treatment.
- Lieut.-Col. E. H. Botterell, Toronto,
Dr. Carl Aberhart, Toronto,
Dr. T. A. Jousse, Toronto and
Dr. J. W. Cluff, Toronto.
The Management of Paraplegic Patients.
- Dr. H. Rocke Robertson, Vancouver.
Nutrition in Surgery.

Wednesday, June 12—Continued

Section of Urology

- Dr. C. B. Stewart, Winnipeg.
The Organic Causes of Enuresis.
- Dr. James M. Campbell, Saskatoon.
Gunshot Wounds of the Genitals.
- Dr. Robin Pearce, Toronto.
Carcinoma of the Prostate.
- Dr. Jean-Paul Legault, Montreal.
Horseshoe Kidney.

Thursday, June 13

ROUND TABLE CONFERENCES

9.00—10.00 a.m.

Anæsthesia

- Chairman: Dr. D. D. Freeze, Vancouver.
Subject: *The Evaluation of Supportive Measures in Anæsthesia.*

Medicine

- Chairman: Dr. C. H. Vrooman, Vancouver.
Subject: *Non-Tuberculous Pulmonary Disease.*

Obstetrics and Gynæcology and Pædiatrics

- Chairman: Dr. A. H. Spohn, Vancouver.
Subject: *Problems of the Newborn.*

Otolaryngology

- Chairman: Dr. W. M. Paton, Vancouver.
Subject: *Acoustic Trauma in Warfare.*

Psychiatry

- Chairman: Dr. J. C. Thomas, Vancouver.
Subject: *Treatment Procedures Including Occupational Therapy, to be discussed under the headings of:*
The Psychotic.
The Neurotic.
The Question of Psychiatry in the General Hospital.

Radiology and Surgery

- Chairman: Dr. G. E. Seldon, Vancouver.
Subject: *The Relationship Between the Surgeon and the Radiologist in the Operating Room.*

Urology

- Chairman: Dr. Lorne Wood, Vancouver.
Subject: *The Problem of Calculus in Urology.*

GENERAL SESSION

Thursday, June 13

10.15 a.m.

- Dr. D. E. H. Cleveland, Vancouver.
Malignant Lymphoma and Cutaneous Symptomatology.
- Dr. J. A. Dauphinee, Toronto.
The Present Status of Anti-biotics in Therapy.

Thursday, June 13—Continued

- Dr. Arthur W. Proetz, Saint Louis, Missouri.
The Nasal Mechanisms—Their Maintenance and Repair.
- Dr. Murray M. Baird, Vancouver.
Chronic or Recurrent Diarrhæa.

Friday, June 14

ROUND TABLE CONFERENCES

9.00—10.00 a.m.

Anæsthesia and Surgery

- Chairman: Dr. T. H. Lennie, Vancouver.
Subject: *Anæsthesia in Abdominal Surgery.*

Dermatology

- Chairman: Dr. D. E. H. Cleveland, Vancouver.
Subject: *Ano-genital Pruritus.*

Medicine

- Chairman: Dr. C. E. Brown, Vancouver.
Subject: *Medical Diseases of the Large Bowel.*

Obstetrics and Radiology

- Chairman: Dr. B. J. Harrison, Vancouver.
Subject: *Roentgenology in Obstetrics.*

Ophthalmology

- Chairman: Dr. Colin Graham, Victoria.
Subject: *The Role of Orthoptics in Eye Muscle Imbalance.*

Psychiatry

- Chairman: Dr. C. H. Gundry, Vancouver.
Subject: *Mental Hygiene in Public Health.*

Urology

- Chairman: Dr. A. W. Hunter, Vancouver.
Subject: *Genito Urinary Infections.*

GENERAL SESSION

Friday, June 14

10.15 a.m.

- Dr. F. A. Turnbull, Vancouver.
Observations About the Surgical Relief of Pain in Cancer.
- Dr. J. Ross Vant, Edmonton.
The Use of Pelvic X-Rays in the General Practitioner's Obstetric Practice.
- Dr. Rubin H. Flocks, Iowa City, Iowa.
Carcinoma of the Bladder. (An analysis of 540 patients with carcinoma of the bladder, with special reference to surgical treatment by the closed and open methods.)
- Dr. W. E. M. Mitchell, Victoria.
Inguinal Hernia.

SECTIONAL MEETINGS

2.15 p.m.

Friday, June 14

Section of Anæsthesia

- Dr. H. B. MacEwen, Vancouver.
Combined Anæsthesia in Orthopædic Surgery.
- Dr. R. A. Gordon, Toronto.
Anæsthesia for Plastic Surgery.
- Dr. H. R. Griffith, Montreal.
The Problem of Muscle Relaxation in Anæsthesia.
- Dr. C. H. Robson, Toronto.
Some Aspects of Anæsthesia in Children.

Section of Dermatology

- Dr. Ben Kanee, Vancouver.
Skin Tests in Dermatology.
- Dr. Norman M. Wrong, Toronto.
Penicillin in Pyoderma.
- Dr. L. P. Ereaux, Montreal.
The Use of Anthallan in Dermatology.
- Dr. Hugh A. MacKechnie, Vancouver.
Small Skin Tumours.

Section of Medicine

- Dr. J. F. C. Anderson, Saskatoon.
A Practical Diagnostic Approach to Allergic Diseases of the Respiratory System.
- Dr. L. G. Bell, Winnipeg.
The Management and Prognosis of Acute and Sub-acute Nephritis.
- Dr. F. S. Brien, London.
Experiences in the Diagnosis and Treatment of Early Syphilis.
- Dr. J. W. Scott, Edmonton.
Tularæmia.

Section of Obstetrics and Gynæcology

- Dr. H. F. P. Grafton, Kamloops.
Uterine Inertia.
- Dr. Léon Gérin-Lajoie, Montreal.
Hydatidiform Mole.
- Dr. John Mann, Toronto.
The Recognition and Treatment of Toxic States in Pregnancy.
- Dr. Ross B. Mitchell, Winnipeg.
Local Anæsthesia in Obstetrics and Gynæcology.

Section of Otolaryngology

- Dr. T. J. Haughton, Regina.
Vertigo.
- Dr. David Ballon, Montreal.
Otitic Meningitis.
- Dr. D. E. S. Wishart, Toronto.
Practical Methods of Testing Hearing.
- Dr. Lavell H. Leeson, Vancouver.
The Treatment of Mastoiditis in Children.

Section of Pædiatrics

- Dr. E. A. Morgan, Toronto and
Dr. D. E. S. Wishart, Toronto.
Laryngo-Tracheo Bronchitis.
- Dr. George A. Campbell, Ottawa and
Dr. P. J. Maloney, Ottawa.
Some Aspects of Endocrinology in Children.
- Dr. Alan Moncrieff, London, England.
Subject of choice.
- Dr. Donald Patterson, London, England.
Subject of choice.
- Dr. C. E. Snelling, Toronto.
The Rh. Factor in Erythroblastosis.

Section of Psychiatry

- The Rôle of the Emotions in the Production of Gastro-Intestinal and Cardio-Vascular Disturbances.*
- Dr. J. P. S. Cathcart, Ottawa.
Gastro-Intestinal Disturbances.
- Dr. Colin Sutherland, Montreal.
Gastro-Intestinal Disturbances.
- Dr. J. Allan Walters, Toronto.
Cardio-Vascular Disturbances.
- Dr. G. F. Strong, Vancouver.
Cardio-Vascular Disturbances.

Section of Radiology

- Dr. P. H. Malcolmson, Edmonton.
Subject of choice.
- Major Jos. Sommers, Overseas.
Superficial Radiation Therapy.
- Dr. H. M. Edmison, Winnipeg.
Albright's Syndrome.
- Dr. Earl W. Spencer, Saskatoon.
A Slide Rule Method of Calculating Gamma "r" Dosage.

Section of Surgery

- Dr. T. M. Jones, Victoria.
The Management of Hæmorrhoids.
- Dr. Angus McLachlin, London.
Fractures About the Ankle Joint.
- Dr. Campbell Gardner, Montreal.
Pruritus Ani.
- Dr. H. F. Robertson, Toronto.
End Results of Therapy in Varicose Veins.
- Dr. Gordon C. Johnston, Vancouver.
Vein Interruption in Prevention of Pulmonary Emboli.

Section of Urology

- Dr. Fred Pilcher, Calgary.
Primary Carcinoma of the Ureter.
- Dr. Rubin H. Flocks, Iowa City, Iowa.
A Method of Uretero-Vesical Anastomosis in Patients where the Proximal Portion of the Ureter is Short (Report of a case).
- Dr. Paul Bourgeois, Montreal.
Subject of choice.
- Dr. J. C. McClelland, Toronto.
Conservative Treatment of Hydronephrosis.

VANCOUVER COMMITTEE ON ARRANGEMENTS

Chairman: Dr. Wallace Wilson
Honorary Secretary: Dr. Lorne G. Wood

COMMITTEES ON PROGRAM

General Chairman: Dr. G. F. Strong
Secretary: Dr. G. O. Matthews

Anæsthesia

Chairman: Dr. D. D. Freeze.
Secretary: Dr. B. McEwen.

Dermatology

Chairman: Dr. D. E. H. Cleveland.
Secretary: Dr. D. H. Williams.

Historical Medicine

Chairman: Dr. G. E. Kidd.
Secretary: Dr. R. A. Simpson.

Medicine

Chairman: Dr. H. A. DesBrisay.
Secretary: Dr. A. Y. McNair.

Obstetrics and Gynæcology

Chairman: Dr. Murray Blair.
Secretary: Dr. A. E. Trites.

Ophthalmology

Chairman: Dr. J. A. McLean.
Secretary: Dr. C. E. Davies.

Otolaryngology

Chairman: Dr. Lavell Leeson.
Secretary: Dr. E. E. Day.

Pædiatrics

Chairman: Dr. Howard Spohn.
Secretary: Dr. Reginald Kinsman.

Radiology

Chairman: Dr. B. J. Harrison.
Secretary: Dr. Andrew Turnbull.

Surgery

Chairman: Dr. A. B. Schinbein.
Secretary: Dr. J. R. Neilson.

Urology

Chairman: Dr. A. W. Hunter.
Secretary: Dr. J. A. McCaffrey.

Psychiatry

Chairman: Dr. G. A. Davidson.
Secretary: Dr. J. C. Thomas.

COMMITTEE ON ORGANIZATION AND ADMINISTRATION

General Chairman: Dr. K. D. Panton
Secretary: Dr. J. H. Blair

Badges, Signs and Flags

Chairman: Dr. R. A. Gilchrist.
Secretary: Dr. S. Sarjeant.

Ceremonial Procedure

Chairman: Dr. T. H. Lennie.
Secretary: Dr. F. J. Hebb.

Commercial Exhibits

Chairman: Dr. S. E. C. Turvey.
Secretary: Major J. Ross Davidson.

Entertainment

Chairman: Dr. W. H. Hatfield.
Secretary: Dr. Chas. Gould.

Golf

Chairman: Dr. J. E. Harrison.

Housing and Equipment

Chairman: Dr. G. F. Busteed.
Secretary: Dr. G. A. Lamont.

Finance

Chairman: Dr. H. H. Milburn.
Secretary: Dr. W. J. Dorrance.

Publicity

Chairman: Dr. J. H. MacDermot.
Secretary: Dr. J. H. B. Grant.

Registration and Information

Chairman: Dr. J. C. Thomas.
Secretary: Dr. Taylor Henry.

Transportation

Chairman: Dr. K. D. Panton.
Secretary: Dr. J. H. Blair.

STOP PRESS

We have just been informed that Convention Travel Rates have been authorized, effective March 16. We have applied for Convention Identification Certificates which should be available in April. By using the certificate, there is a considerable saving in fares; for example, between Toronto and Banff the saving is \$27.75.

Members desiring certificates should apply to the General Secretary at the Toronto Office.

Le Congrès des Médecins de Langue Française de l'Amérique du Nord

We have received the following note from Dr. Charles Vézina, President of the 18th Congress of French speaking Physicians of North America.

"Le Congrès des Médecins de langue française de l'Amérique du Nord se tiendra à Québec les 13, 14 et 15 juin 1946. Nous regrettons d'être dans l'obligation de faire ce congrès à peu près aux mêmes dates que la réunion à Banff de l'Association médicale canadienne. L'on voudra bien voir dans le choix de ces dates que l'impossibilité absolue de ne pouvoir tenir cette réunion à un autre moment de l'année."

We share Dr. Vézina's regret that the date of the meeting should conflict with our Annual Meeting in Banff, and appreciate that it was not possible to arrange an alternative date.

The General Secretary's Page

When I was a small boy I well remember how frequently my cousin cried with pains in his legs after we had been put to bed. Growing pains, the parents called them. Intermittent claudication, I learned years later, was the proper terminology, but much less descriptive.

Well, we at 184 College Street are suffering from growing pains. Please observe that I said *from*, not *with*. The University of Toronto is doing the growing and we are experiencing the pain of moving. It is this way. Nearly twenty-three years ago, the University of Toronto placed office accommodation at the disposal of the Canadian and Ontario Medical Associations at 184 College Street for the large sum (!) of one dollar a year, and here we have remained throughout that lengthy period, comfortably and courteously cared for. Now with the war over and thousands of returned soldiers awaiting opportunities for higher education, the University must expand its facilities. So down comes our old house to make way for a new science building which is planned to occupy a wide area on College Street. While regretfully we take our departure, we are deeply sensible of the hospitality which we have enjoyed at the hands of the University Board of Governors, and most cordially do we extend our thanks.

Perhaps by the time this page is printed we shall be in our new quarters at 135 St. Clair Avenue West, at Avenue Road, sharing with some twenty or thirty families the splendid old building known as the Deaconess Training School of the United Church. During the war the building was used by the Women's Division of the Army, but was recently purchased by the Ontario Hospital Association for office use. Then in stepped the City Fathers who said that families must come first in housing and only a small section of the building could be used for office purposes. So we expect to find ourselves surrounded for two or three years by children and perambulators. However, we are delighted to find a home and as we love children and have no quarrel with perambulators, we are quite sure that we will be comfortable. Right now we are packing and sorting, discarding and saving, going over records dating back seventy-five years, and muttering a little about the whole business. (Have you ever moved?) But when you write to us for some information we shall hope to be able to locate the proper files. There may be a blind spot for a short period, but if so, I am sure you will be patient and understanding if you do not receive a prompt reply.

It is with much satisfaction that we announce the appointment as of March 1, 1946, of Dr. A. D. Kelly as Assistant Secretary of the Association. Dr. Kelly will continue to act as Secre-

tary of the Ontario Medical Association until his successor has been appointed and made familiar with his duties—a period which it is expected will not be longer than a year. After more than five years of war service, during which time he became second in command in the R.C.A.F. Medical Services, Dr. Kelly returned to his post with the O.M.A. last October. When it became necessary to choose an Assistant Secretary for the C.M.A., the Executive Committee was unanimous in its choice and I am confident that as they get to know him, the medical profession across Canada will recognize the soundness of the selection.

The Department of National Defence announced recently that the Canadian Medical Procurement and Assignment Board would be dissolved on March 31, 1946. The final meeting of the Board, to which the nine Divisional Advisory Committee Chairmen were invited, was held in Ottawa on March 6. It is hoped that, in an early issue of the *Journal*, an article may appear describing in some detail the activities and accomplishments of the Board. There was general agreement at the meeting that the Board had fulfilled a useful purpose in Canada's war effort. This opinion was crystallized in a motion which recommended to the Government that some continuing co-ordinating committee be established representing the several Governmental medical services with co-opted members from the medical and hospital associations.

It is interesting to note that 5,026 Doctors enlisted in the three Canadian Services, broken down into Army, 3,719; Air Force, 845; and Navy, 462. This represents nearly 40% of Canada's 13,000 Doctors—a most creditable record and one which will no doubt compare favourably with any of our Allies.

In examining some old Minutes, I found this resolution which was passed by the Section of Military Medicine at our annual meeting in 1938:

"The Section of Military Medicine strongly urges that a complete survey be made of the medical profession of Canada in order that in time of national emergency, proper advice may be given as to the distribution of the medical profession both for service abroad and at home."

It took quite some time to persuade the Government to carry out the spirit of this resolution but, in 1942, the C.M.P.A.B. was formed, following which a national survey was made and advice was offered and accepted. If ever our country faces another such emergency, which, pray God, it never will, it is to be hoped that no time will be lost in setting up an organization patterned after the C.M.P.A.B. which has now finished its task.

UNIVERSITY NOTES

University of Alberta

On January 5, 1946, the second last special convocation for accelerated medical students in the University of Alberta was held in Convocation Hall. The following candidates, all enlisted, received the degree of Doctor of Medicine: William Robert Barclay, Vancouver; Louis E. Beauchamp, Edmonton; William Leland Lloyd Bennett, Edmonton; George Rene Boileau, Edmonton; Kenneth Alfred Bradshaw, Edmonton; Gilbert McCully Campbell, Edmonton; Richard Crofton Blakely Corbet, Calgary; Lewis Homer Edwards, Three Hills, Alberta; Lloyd Carl Grisdale, Olds; Julius Guild, Lethbridge; Jean Templeton Hugill, Edmonton; Robert James Johnston, Edmonton; Hector Neil MacKinnon, Calgary; Lloyd B. MacLaren, Creston, B.C.; Teddy Lee Marfleet, Marwayne, Alta.; Maurice Marshall, Taber, Alta.; James Overgard Metcalfe, Lethbridge; George Edward Sleath, New Westminster, B.C.; George Lewis Smith, Kimberley, B.C.; Kathleen Anderson Swallow, Edmonton.

The following awards were presented: Moshier Memorial Medal, G. E. Sleath; Mewburn Memorial Medal, R. J. Johnston; Scholarship of the College of Physicians and Surgeons of Alberta, (Medicine), G. E. Sleath; (Surgery), R. J. Johnston; Harrison Prize in Obstetrics and Gynecology, G. R. Boileau.

An interesting feature of the Convocation was the granting of the honorary degree of Doctor of Laws to Lieut.-Col. Allan Coats Rankin, C.M.G., M.D., D.P.H., F.R.C.P.[C.] who was Dean of the Faculty of Medicine, Professor of Bacteriology, and Director of the Provincial Laboratory through a period of over thirty years and who served with distinction in the Royal Canadian Army Medical Corps in both world wars.

CORRESPONDENCE

Postgraduate Training

To the Editor:

The recent plea of Dr. McPhedran for postgraduate medical training in Canada will find immediate support among the men returning from the services. Clinical training facilities in England and the United States are already overtaxed with men from those countries and many more. It would seem that Canada during the war has developed into a nation of the first class in every sphere except that of postgraduate medical education. Necessity is going to force us to improvise some better method of training recent graduates now being discharged from war service, for the facilities at hand are inadequate to meet the demand for internship and research fellowships. It is a genuine, not an imaginary demand. The doctors seeking this training at present have their rehabilitation grants to support them, and the Department of Veterans' Affairs will pay tuition fees up to \$500 per year.

The rehabilitation arrangements under the Federal Government are making it economically possible for young Canadian doctors to take the postgraduate training which they have so long wanted but could not afford. It is hoped that this opportunity which the war has provided will be continued by similar Federal assistance during the peace. It is concerning this latter aspect of postgraduate training for the future that we are writing.

We believe that a great national economy could be effected if the quality of the medical care given in Canada could be raised to such a point that patients would not have to consult a multiplicity of doctors before a diagnosis was firmly established and definitive treatment given. Better medicine would leave less room for irregular practitioners and more money in the

patient's pocket, while less time would be lost from work. A recent case comes to mind of a labourer who ruptured an intervertebral disc in 1929 and spent the next sixteen years and all his savings before arriving at an Out Patient Clinic where a diagnosis was made and a successful operation performed following admission to hospital. It so happened that although this man had seen forty-seven doctors, he had visited only three chiropractors during this long period of suffering: any other person in his position might have been less loyal to his medical advisers.

The inefficiency in our methods of providing doctors for Canada lies not in lack of numbers trained but in the lack of hospital training at the graduate level. Many schools require a B.A. degree for entrance, followed by at least four years of undergraduate instruction, for the M.D. degree. Then the potential practitioner arrives at the intern level financially out of breath, just at the time he should, for the good of the country, be able to look forward to two or three years of supervised clinical training in which the responsibility for diagnosis and treatment of patients confronts him realistically.

The nature of the usual compulsory year of internship varies widely in Canada, and there seems to be a growing tendency to "rotate" interns so rapidly that they develop an intellectual nystagmus, with the quick phase towards the eccentricities of the various clinical chiefs and the slow phase towards the patients.

The solution to the problems outlined above would seem to lie in the establishment of widespread postgraduate medical scholarships. These would be tenable at hospitals where teaching was given its proper place, and would help such hospitals, which are chronically understaffed, to give medical care to their patients in keeping with the latest advances of medical science.

The cost of such scholarships to Canada would be that of one four-engined bomber for each year of graduates across the country. Such an expenditure in wartime was thought to be trivial. In peace time it would give every intern \$100 a month for a full year of graduate clinical training. In a nation whose fighting strength in 1939 was shown to be halved due to disease, such an expenditure would constitute a first step towards national defence. It would be an investment in national health, which would yield a good return.

For too long postgraduate clinical training has been thought of as a luxury, possibly because so few doctors on graduation could afford it. We are now realizing that such clinical training is absolutely essential to the provision of scientific medical care for the population. Whether Canada's new Department of National Health and Welfare institutes the necessary scholarships or the Department of National Defence forms a Medical Reserve, with \$100 a month pay and allowances, composed of all the doctors in Canada taking postgraduate clinical training, the need is the same, namely for early action on this too-long overlooked medical problem.

To be effective nationally the scholarships would have to be available to every graduate. The tendency has been to give little consideration to the training of any but the best students in each year. It will be the average student who will carry the load in medical practice after graduation, and it is for him that the scholarships will be most useful.

As an emerging world power Canada must take more active steps to improve her national health. The immediate expansion of postgraduate training facilities for returning veterans must proceed hand in hand with the development of a system of scholarships which will enable all graduates from now on to take the hospital training which the health standards of Canada now show to be necessary.

G. W. THOMAS, W. C. GIBSON, G. W. FITZGERALD,
H. G. KELLY, C. BERTRAND, A. W. HARDY,
J. F. TOMASELLI, J. C. CLARK, P. MADORE, E. WEBB.

Montreal

Boerhaave and the University of Edinburgh

To the Editor:

In your most interesting report of a Clinical Meeting of No. 1 Canadian General Hospital in Holland published in your March number, Lieut.-Colonel Johnston paid a deserved compliment to the ancient university of Leyden. He states "Through the intellectual leadership given to clinicians from Edinburgh by Herman Boerhaave, the Medical School of the University of Edinburgh was founded". It may be possible to justify this statement to some extent but the fact is that three professors in medicine were appointed to the University of Edinburgh in 1685. One of these was Archibald Pitcairne, who, in 1692, was made Professor of Medicine in Leyden and taught Boerhaave. The latter looked to Sydenham as his inspiration but always alluded to Pitcairne with respect.

The "Edinburgh method" was adopted in founding the first school of medicine in America by Physic of Philadelphia and, later, it was used as a model by McGill and other universities on this continent. Col. Johnston turned a neat compliment but when Boerhaave's influence was felt in Edinburgh the ground had been well prepared. Not the least among those who did the spade work was Pitcairne, the preceptor of Boerhaave.

MALCOLM H. V. CAMERON.

SPECIAL CORRESPONDENCE

The London Letter

(From our own correspondent)

STUDENT HEALTH

The latest of the excellent series of reports published by the Royal College of Physicians is devoted to the question of "student health services". In the past such services have been wholly inadequate. According to a report drawn up by the four largest student organizations in the country, in 1939 only 6 of 31 university colleges had a compulsory medical examination on entrance, and 4 had a voluntary examination. In 1943 the corresponding figures were 9 and 2. In no case was there anything like a complete medical service. The Royal College of Physicians committee recommend that the universities should accept greater responsibility for the health of students and that, to this end, every student should have a medical examination after entry and at regular intervals thereafter. In addition, medical and nursing care should be made available for students when they are ill.

As a means to maintaining health and preventing illness, it is recommended that universities should exercise stricter supervision of lodgings available for students and that they should accept responsibility for providing adequate canteen facilities where students can obtain reasonable meals at a reasonable price. As one means of effecting adequate medical supervision of students it is suggested that universities should appoint special medical officers for this purpose. This is a suggestion that is already being considered by several universities, and the University of Aberdeen has announced that it will shortly be proceeding to the appointment of a physician on a full-time basis "to take charge of Student Health Services". In addition he will be expected to carry out investigations into the effect on health of the conditions under which students and nurses live and work. There is little doubt that this is an example that will be followed by many other universities.

DENTISTS AND DOCTORS

The final report of an Inter-departmental Committee on Dentistry, that has just been published, recommends the recognition of dentistry as a self-governing profes-

sion, separate from medicine. While to many this appears to be a logical development of the Dentists' Act of 1921, there is a strong minority in the medical profession that feels that it is a retrograde step and will not enhance the status of the dental profession. The argument is that dentistry is no more outside the field of medicine than ophthalmology or oto-rhino-laryngology, and that, like these, dentistry should be regarded as a special branch of medicine, for the efficient practice of which a medical qualification is necessary.

The present arrangement means that dental surgeons tend to find much of their time occupied with the mechanical side of their work, such as fillings and dentures, for which no special knowledge of medicine is required. The result is that the most important aspect of dentistry—the care and preservation of healthy teeth—is not receiving the attention it deserves.

At the moment there are 14,459 registered dentists in the country, and the Inter-Departmental Committee estimates that at least 20,000 are required to provide an efficient dental service. This number is not likely to be attained unless the profession is made more attractive, and one of the best means of doing this would be to improve the status of the profession by insisting upon a medical qualification and taking away from the qualified dentist some of the routine mechanical tasks which at the moment occupy so much of his time.

One way of achieving this last aim would be to train and recognize a class of ancillary workers or "dental nurses" who, under the supervision of fully trained dentists, would be able to carry out much of the mechanical work, such as filling and the making of dentures; much as the ophthalmologist after doing refractions sends his patient to the optician to have spectacles made. This is a suggestion upon which the dental profession is deeply divided, but it is obviously a matter requiring careful thought.

SHORTAGE OF BLOOD DONORS

When the medical history of the 1939 to 1945 War comes to be written, one of the outstanding features will be the story of the blood transfusion services: not only the skill with which it was organized, but also the wonderful response of the country to the demand for blood donors. Since the end of the war, as was only natural, there has been a marked drop in the number of donors, and in view of what is officially described as an "alarming" situation, a renewed appeal has been made for donors. As an example of the present position, it is reported that in one area the panel of donors has dropped from 48,000 to 12,000 members.

The Ministry of Health has pointed out that the cessation of hostilities does not mean the cessation of transfusions, and that actually, as a result of wartime experience, there has been a greatly extended use of transfusions in civilian practice. Thus in one hospital which formerly used 80 pints of blood a year, 30 to 50 pints are used every week. The present appeal is for 200,000 donors, and it is pointed out that should this number be reached, individual donors will not be called upon more than once or twice a year.

A MENTAL HEALTH SERVICE

In 1942 the Ministry of Health sponsored a survey of the incidence of neurotic disorders in England and Wales, with special reference to the facilities available for out-patient treatment. This survey, which was undertaken by Dr. C. P. Blacker, developed into a much wider field and covered the mental health services at present available. Dr. Blacker's report, which has just been published, constitutes one of the most important contributions to the subject that has yet been published in this country. In 1941 and 1942 there was a definite increase in the number of cases of neurosis, but there is good reason for believing that at least part of this increase was due to an increased use of the available clinic facilities.

No evidence was found of an increase in the more serious forms of mental disease, a finding which is

supported by the annual report of the Board of Control for 1944. The Board of Control also noted that there is an increasing tendency for many patients, who hitherto feared to admit that they were ill, to be ready to accept treatment. As Dr. Blacker points out, however, there is every likelihood that during the difficult years that lie ahead there may well be an increase in neurotic disorders, and if this is to be adequately dealt with, it is essential that there should be an increase in the number of clinics available and a more equable distribution throughout the country. Thus, at the time of the survey, the number of clinics varied from 3.66 per 1,000,000 of population in one district to 9.14 in another. It is estimated that during the next few years out-patient facilities should be extended by 75 to 100%, and that, outside mental hospitals, 100 beds for 1,000,000 of the population should be provided for in-patients.

The problem of supplying sufficient trained psychiatrists, psychologists, social workers and occupational therapists is one that will tax the ingenuity of all concerned, but as a result of Dr. Blacker's survey we do at least know the extent of the problem.

WILLIAM A. R. THOMSON

London, March, 1946.

MEDICAL SOCIETIES

La société médicale des hôpitaux universitaires de Québec

Séance de la société médicale des hôpitaux universitaires de Québec tenue à l'Hôpital du St-Sacrement, le 16 novembre 1945, à 8 h. 30 du soir.

RÉSECTION DE L'ILÉON TERMINAL CHEZ UN NOURRISSON DE 10 MOIS—GUÉRISON.—F. Trempe et M. Langlois.

Une observation assez inusitée est présentée, si l'on considère l'âge du malade qui en fait le sujet en regard de l'intervention chirurgicale subie. Une revue de la littérature est faite qui montre l'extrême gravité de toute résection intestinale "chez les au-dessous de un an". On y trouve que seulement vingt-quatre résections suivies de guérison ont été rapportées chez des nourrissons d'âge inférieur à un an.

Le 25e cas fait donc le sujet de cette communication et c'est un bébé de 10 mois, chez qui les lésions suivantes furent trouvées à l'opération: anse iléale terminale infarctisée, avec ici et là des plaques nécrotiques, perforation iléale sous-séreuse près du cæcum avec collection gazo-stercorale fusant dans la racine du mésentère, le tout le résultat d'une invagination iléo-cæcale désinvaginée spontanément à la faveur de la perforation sous-séreuse. On fait une résection de l'iléon terminal malade, suivie d'une iléo-cæcostomie latéro-latérale. Après quelques incidents post-opératoires, le bébé guérit; il est même présenté en personne.

Ce succès est attribué à la surveillance étroite des soins post-opératoires, au siphon gastrique en permanence, à la pénicilline administrée préventivement, enfin à une collaboration généreuse de la part du pédiatre qui, mieux que le chirurgien, comprend les réactions de ces tout-petits.

A PROPOS D'ALLAITEMENT AUX QUATRE HEURES CHEZ LE NOUVEAU-NÉ.—Marcel Langlois et Antoine LaRue.

Depuis que nous employons la méthode d'allaitement aux quatre heures chez les nouveaux-nés, nous avons observé une quarantaine de bébés.

Voici le pourcentage obtenu d'après le poids de naissance en livres:

3½ livres à 5½	8.8%	ration calorique 100 lbs
5½ livres à 6½	11.7%	ration calorique 65 lbs
6½ livres à 7½	41.1%	ration calorique 50 lbs
7½ livres à 9½	39.4%	ration calorique 50 lbs

Chez tous ces bébés, nous avons constaté une perte de poids physiologique de 7 à 8½ onces pour une période de cinq à huit jours et un retour au poids initial après douze ou quatorze jours. Avec quelques auteurs américains (Kugelman, Marriot and Jeans) nous avons noté la rareté des incidents digestifs, un sommeil mieux réglé et une augmentation normale du poids. Nous avons également remarqué que les gerçures du sein apparaissent plus rarement.

Citons deux inconvénients sans suite fâcheuse: (1) convaincre la mère qu'elle ne doit pas forcer son enfant à boire toute la quantité prescrite; (2) ne pas se laisser intimider par les pleurs de quelques nouveaux-nés gloutons qui, durant les premiers jours, ne veulent pas attendre les heures fixées. Un peu de persistance surmonte ces ennuis.

MANIFESTATIONS ALLERGIQUES ET OTO-RHINO-LARYNGOLOGIE.—Jules Hallé.

Après un bref aperçu historique de l'allergie, l'auteur explique que l'étude du facteur allergique est devenu un fait courant en oto-rhino-laryngologie. Il cite de nombreux auteurs qui ont prouvé scientifiquement la présence de manifestations anaphylactiques dans un grand nombre d'infections chroniques du nez, des sinus et de la gorge particulièrement. Il rapporte quarante-et-une observations personnelles dont quatre, où la gomme arabique, les tomates, la poussière de maison, les arachides et la vitamine B sont les facteurs allergiques. L'auteur conclut qu'un diagnostic d'allergie ne devrait pas être rejeté d'emblée, parce que l'agent responsable n'a pu être décelé. L'intra-dermo-réaction et la cuti-réaction ne sont que des moyens de diagnostic et leur silence illustre plus leur insuffisance que la négation du facteur causal. Une observation clinique attentive, une enquête minutieuse sur les habitudes du malade, seront les facteurs décisifs, qui devront toujours supplanter les épreuves protéiques, forcément incomplètes.

CANCER DU REIN ET DIAGNOSTIC RADIOLOGIQUE.—J.-N. Lavergne.

L'auteur étudie d'abord les symptômes du cancer du rein et leur valeur respective au point de vue diagnostic précoce; devant leur insuffisance, il conclut que seul le diagnostic radiologique par la pyélographie rétrograde peut apporter la certitude en mettant en évidence les déformations que produit la tumeur au niveau des cavités rénales, déformations qui sont surtout représentées par les images d'enlèvement que sont les amputations des calices et du bassinet.

Puis l'auteur cite les observations de deux tumeurs du pôle inférieur du rein, en l'espèce deux hyper-néphromes, qui ont pu atteindre un volume important sans déterminer la moindre déformation des cavités rénales; le seul signe radiologique qu'a pu fournir la pyélographie rétrograde a été, dans les deux cas, un refoulement de l'uretère vers la ligne médiane.

L'auteur termine en disant que le déjettement interne de l'uretère, habituellement un symptôme accessoire, peut prendre dans certains cas une importance primordiale; il est d'avis que, non seulement on peut, mais on doit lui accorder, dans des conditions particulières, une haute valeur diagnostique.

La Société de Chirurgie de Montréal

Le mercredi 6 février, 1946.

CONSIDÉRATIONS SUR DEUX CAS D'AMÉNORRÉE PRIMITIVE.—Léon Gérin-Lajoie.

L'auteur s'excuse de revenir sur deux cas d'aménorrhée dont il a présenté les histoires à une séance de la Société Médicale de Montréal l'an dernier. Il résumé

brièvement pour mémoire, ce qu'il a déjà dit sur ce sujet. L'un des cas a bénéficié d'un acte chirurgical et l'auteur étudie en détails la technique utilisée pour la néoformation d'une cavité vaginale, en l'occurrence la technique de Lawrence R. Wharton. Elle est simple, facile, nullement choquante et jusqu'ici les résultats ont été des plus satisfaisants, non seulement dans ce cas particulier mais également dans d'autres cas qu'il a eu l'occasion de suivre dans le service de gynécologie à l'Hôpital Notre-dame.

CANCER DU COLON ET APPENDICITE AIGUE.—Pierre Smith.

L'appendicite aigue se manifeste souvent au cours de l'évolution d'un cancer du colon comme en témoignent les trois cas suivants observés au cours de l'année 1945 dans le service de chirurgie de l'Hôpital St-Luc.

PREMIER CAS

H., âgé de 79 ans, opéré le 8 février, 1945 pour abcès appendiculaire. Opération suivie de fistule caecale. Réopéré le 19 novembre 1945 pour appendicectomie et fermeture de la fistule. Décédé quatre jours plus tard de péritonite.

Autopsie: néo sténosant situé à l'angle hépatique du colon.

DEUXIÈME CAS

F., âgée de 54 ans. Morte de péritonite le 31 août, 1945.

Autopsie: lithiase biliaire, péri-hépatite, pelvi-péritonite, appendicite aigue rupturée, cancer du rectum.

TROISIÈME CAS

F., âgée de 49 ans, très obèse. Entre à l'hôpital en état d'occlusion et de péritonite. Morte dans les heures qui suivent son admission.

Autopsie: péritonite généralisée, appendicite aigue perforée, occlusion intestinale, métastases hépatiques cancéreuses, néo du colon sténosant de l'angle hépatique.

CONSIDERATIONS

Souvent le syndrome appendiculaire aigu masque une lésion cancéreuse préexistante du colon. Il convient donc de ne pas l'oublier surtout en présence de malades adultes. Les explorations systématiques avec tous les moyens de recherche dont on dispose, devront être mis en œuvre afin de ne pas méconnaître le cancer du colon et pour ne pas retarder une opération qui pourrait être encore curatrice dans maints cas.

Peterborough Medical Society

The February meeting of the Peterborough Medical Society was held in the Veterans' Hospital. Dr. Thomas G. Heaton of Toronto gave an excellent paper on "Bronchiectasis" which was greatly appreciated by the members.

Welland County Medical Society

The Welland County Medical Society held its election of officers in February. Dr. T. E. Bryant is President. The Society welcomed back from active service Major F. C. Myers of Fonthill and made him Vice-president. Wing Commander M. S. MacLean is assured that his colleagues were glad to see him home again by his election to the office of Secretary-Treasurer.

The Welland County General Hospital now has 200 beds and its facilities, complete as they are, are taxed to the utmost.

Toronto Academy of Medicine

At its stated meeting in February, the Toronto Academy of Medicine entertained Professor Samuel H. Levine of Harvard Medical School and was rewarded by a brilliant address on "Congestive heart failure".

MISCELLANY

First Day Out

I never knew
That sun and air could be so warm and sweet;
That such strange things could happen
To knees and feet!

I never knew
How clear and shining April skies could glow;
How just to cross a roadway
Could scare me so!

I never knew
That homely sparrows sang so sweet a song;
Or that the short block to the doctor's office
Could grow so long!

E. MARGARET CLARKSON

Parliamentary Reports

[Extracts from "The Lancet", February 23, 1946.]

NUTRITION IN NEWFOUNDLAND

Mr. J. Lewis asked the Under-Secretary of State for Dominion Affairs what action has so far been taken in Newfoundland to deal with malnutrition resulting from dietary deficiencies; and when the report on the whole subject is to be published.—Mr. J. Parker replied: Acting on expert advice, the Newfoundland government have taken fortified flour and margarine to overcome the lack of balance in the normal diet of sections of the Newfoundland people. In addition they invited a committee of experts on nutritional questions from the United Kingdom, Canada, and the U.S.A. to visit Newfoundland in the summer of 1944 to survey the island. The report of this committee was published in the *Canadian Medical Association Journal* in the spring of 1945 (see *Lancet*, 1: 760, 1945) and it has since been the subject of detailed study by the commission of government. A further visit to Newfoundland was undertaken in August of last year by Dr. D. P. Cuthbertson, now director of the Rowett Research Institute, who, during the course of his discussions with the Newfoundland authorities, put forward a number of preliminary recommendations for their consideration. Dr. Cuthbertson's full report is expected shortly.

In England Now

There is mutiny in the home. Amazon cries for the blood of Sir Ben are heard in a thousand houses where a few short weeks ago the daily chores were pursued in domestic peace. The Minister of Food himself applied the spark to the powder-keg on which he was perched by casually dropping dried eggs, having been apparently unaware of their explosive charge. In these days of public-relations departments, propaganda, and polls of opinion, when the thoughts of the nation are systematically canalized, converted, or docketed, it is refreshing to encounter a Minister with his head in the air (or is it the sand?), heedless of the passing throng. Not so heedless now, for the hunt is up, and the ladies won't let any Gallup save their prey.

The housewife's case deserves a sympathetic ear; that it has not been more widely heard before is due simply to her long forbearance. For more than six years she has daily sought to devise new dishes from all-too-familiar ingredients, to make four ounces do duty for a pound, to satisfy young appetites by foregoing her rightful share. For more than six years she has, without help, maintained the home by making and patching and mending. And for more than six years she has plodded forth and wasted precious time in queues, often to be rewarded with "only for our regular customers", or

"none till Friday". Whoever else stole a holiday, it was not the housewife. She has been always on the job, living not over the shop but in it. She sustained herself by glorious dreams of "after the war", and when the war did at last end, no one told her bluntly that times for her would still be hard and might even get harder. Now she is tired out. Around her she sees almost every other section of the community returning towards normal with relaxation of controls and the issue of better supplies, whereas the first winter of peace will end for her with all the old restrictions still in force, and a few new ones for good measure.

It behoves us to avert a sit-down strike in the kitchen. How can we help? In the first place, the distributive trades are still grossly understaffed. The defence produced in some quarters that delay in shopping is due to shortage of supplies is specious, or—not to put too fine a point on it—phony. The delay is due to shortage of labour behind the counter. Has it occurred to nobody that more man-hours are wasted by people waiting in queues than would be sacrificed by allotting extra assistants to the shops? This is a simple theory, and therefore unlikely to be considered sound economics, but it appeals to me.

If the housewife cannot have more eggs and cooking fat for cakes and puddings, at least give her some latitude in the non-essential foods. Let us use every available hold in ships returning from countries in the sterling bloc for foods that were rightly excluded during the war—all those non-essential oddments that used to delight our palates, and which can now ease the lot of the cook in her continued plight. Come to that, are we making fair use of present supplies? What of the 12% that goes to catering establishments? Does each household (collectively or through one member) take an eighth of its food outside the home? If not, then the present system is unfair and should be replaced by one demanding the surrender of a coupon for every meal taken in a public place which contains rationed food. The administrative objections to this course must bow before the need for an equal share for all.

The housewife has long been pondering on these questions. Now she has suddenly found her voice and spoken with a force that has compelled attention. It is a feminine gibe that the regulation of food (and, for that matter, of clothes) is devised by ignorant males with no understanding of domestic matters. This may be unjust; but I hope the Government will not lightly dismiss the housewife's claim for a place in the councils of the Food Ministry. In the meantime, the Minister of Food ought to desert his office one day and spend an hour or two in a queue—his ears would burn.

ABSTRACTS FROM CURRENT LITERATURE

Medicine

The Incidence of Leukæmia in Radiologists. Ulrich, H.: *New England J. Med.*, 234: 45, 1946.

X-ray exposure has been suggested as a cause of leukæmia because of animal experimentation and also as a result of several reports in the literature of the disease occurring in workers exposed to radiation. One such example is cited by the author.

A statistical study of 34,626 obituary notices in the *Journal of the American Medical Association* (covering the ten-year period 1935 to 1944) showed an incidence of leukæmia of 3.9% among 205 radiologists. Since this figure was more than eight times greater than among the remainder of the physicians, it was considered to be substantial evidence that exposure to radiation is a potential cause of leukæmia.

NORMAN S. SKINNER

Mental Breaking Points. Dynes, J. B.: *New England J. Med.* 234: 42, 1946.

The experience of the author, gained at a naval receiving station examining men fresh from duty and survivors of ship sinkings, is contrary to the theory that all men have mental breaking points. From a practical standpoint the great majority of fighting men are capable of absorbing the shock of all the blows to which they are subjected without any resulting psychiatric symptoms. It is only the man with a defective or maladjusted emotional life who is likely to break mentally under the stress of military duty.

NORMAN S. SKINNER

Ice Cream as a Source of Riboflavin, Carotene and Ascorbic Acid. Holmes, A. D., Kuzmeski, J. W., Jones, C. P. and Canavan, F. T.: *New England J. Med.*, 234: 47, 1946.

Ice cream is usually considered as a luxury food only and not in its true light as a valuable source of protein, fat carbohydrate and minerals. The retail value of the amount annually consumed in the United States is about one-fourth that of total milk consumption and more than twice that of eggs, apples or potatoes.

The nutritive value of ice cream varies with the type of ingredients used and with the process of manufacture. It is an excellent source of carotene and riboflavin but no ascorbic acid is present, probably because of the large amount of air incorporated in commercial ice cream to increase its bulk.

NORMAN S. SKINNER

Chronic Hæmolytic Anæmia with Paroxysmal Nocturnal Hæmoglobinuria. Manchester, R. C.: *Ann. Int. Med.*, 23: 935, 1945.

Two cases of hæmolytic anæmia are reported with paroxysmal nocturnal hæmoglobinuria with full clinical and laboratory findings. The outstanding clinical features are anæmia, icterus, hæmoglobinæmia, leukopenia, paroxysms of hæmoglobinuria, persistent hæmosiderinuria, tendency to vascular thrombosis, and a chronic unremitting course capable of persisting through many years. Splenectomy, as well as other forms of known treatment, is of no value.

Accelerated hæmolysis occurs during acute infections and relapses of malaria as well as spontaneously and during sleep. Hæmosiderinuria may be considered as indicating the existence of chronic hæmoglobinæmia exceeding the minimal renal threshold and reflects stuffing of the renal convoluted tubular epithelium with breakdown products of hæmoglobin. The absence of spherocytic erythrocytes is in direct contrast to most other types of hæmolytic anæmia and acute hæmoglobinurias in which spherocytosis represents a phase in the process of erythrocyte disintegration and indicates a different hæmolyzing mechanism is involved.

S. R. TOWNSEND

Cranial Arteritis: A Critical Evaluation of the Syndrome of "Temporal Arteritis" with Report of a Case. Kilbourne, E. D. and Wolff, H. G.: *Ann. Int. Med.*, 24: 1, 1946.

The syndrome heretofore designated as "temporal arteritis" is a well-defined symptom complex occurring in aged people of the white race. All but one of the patients studied presented signs and symptoms generally associated with infection, namely, anorexia, prostration, fever, sweats, weight loss, and leucocytosis; and locally, over the artery, there was heat, swelling, tenderness, redness and pain.

The distribution of pain and tenderness is indicative of preceding or concurrent inflammation of the arteries of the lower half of the head. In half of the patients pain over the distribution of these arteries was primary. In more than half of the patients studied there was evidence of preceding or concomitant infection in the head, suggesting the possibility of spread of this infection by contiguity along the walls of branches of the external carotid artery.

Differentiation of "temporal arteritis" from periarteritis nodosa cannot be made from the study of histopathological sections of the diseased arteries. Although in many cases of "temporal arteritis" giant cells are found, in some eosinophilic infiltration in the absence of giant cells has occurred. Thus, there is no specificity of cellular reaction.

The name "temporal arteritis" is misleading, since it is probable that the disease involves other arteries of the head. Therefore, for the syndrome heretofore known as "temporal arteritis", the authors suggest the term "cranial arteritis" as a more definite and inclusive descriptive title.

S. R. TOWNSEND

Polyarteritis Nodosa: Report of Eleven Cases with Review of Recent Literature. Logue, R. B. and Mullins, F.: *Ann. Int. Med.*, 24: 11, 1946.

Of eleven cases of polyarteritis nodosa, ten were male and one was female. The ages ranged from 15 to 65. The duration of the illness varied from two and one-half months to one year, with recovery in one patient who was alive and well two years later. Hypertension was present in every patient at some time during the course of the disease. Leukocytosis was noted in every case and eosinophilia was present in five patients. A diagnosis was made in each instance during life, on three occasions by laparotomy. One case developed a perirenal hæmorrhage and nephrectomy was performed because of a suspected neoplasm. Another died of a dissecting aneurysm which was unrelated to polyarteritis, there being no evidence of such disease in the aorta. Four cases showed clinical and pathologic evidence of involvement of the coronary arteries with progressive electrocardiographic evidence of coronary insufficiency; three patients showed clinical and pathologic evidence of involvement of the testicular arteries.

The recent literature is reviewed and the symptoms of 177 cases are tabulated. Serial electrocardiograms demonstrating progressive involvement of the coronary arteries in three cases are recorded. A case of apparent spontaneous cure of two years' duration is reported.

S. R. TOWNSEND

The Early Diagnosis of Minimal Pulmonary Tuberculosis. Bobrowitz, J. D. and Dwork, R. E.: *New England J. Med.*, 234: January 3, 1946.

It is very important to diagnose tuberculosis in the minimal stage because (1) Percentage of arrested cases is highest. (2) Length of treatment is shortest. (3) Less instability. (4) Collapse measures infrequent and when used, fewer complications. (5) Sputum not so often positive. (6) Mortality rate markedly less. (7) Need for readmission after discharge from sanatorium increases as the stage of the disease advances. (8) Percentage of those employed is higher in this group.

Early diagnosis and cure of the disease avoids the spread of tuberculosis from persons with positive sputum to their families and the community. The general practitioner is an extremely valuable case finding agent because so many patients see him before anyone else.

To determine the factors that could aid the making of an early diagnosis, 200 cases with minimal lesions were studied, 155 between age 15 and 35, 45 over 35 with 20 over 40. The fact that tuberculosis often occurs in the elderly, should be strongly emphasized. Older people are a great source of infection, their symptoms being explained as chronic bronchitis, asthma, winter or cigarette cough. Tuberculosis should be suspected at any age or in any occupation and in any type of social and economic background.

A history of contact with tuberculosis is significant mainly in its indication that the patient has had opportunities to become infected. Every contact case should have a complete examination including x-ray at once and repeated every year. Of 200 patients only 37 were without symptoms: 155 had specific complaints, 8 gave a history of pleurisy.

The authors are aware of the fact that sanatorium patients are symptom-conscious but they believe that complaints actually exist and that close questioning will verify this fact. The symptoms of minimal tuberculosis are not specific for this disease. Therefore the diagnosis can be made only by x-ray examination. In this series 75% of the errors were in diagnosis of non-tuberculous conditions. To prevent these errors do not make a diagnosis of pneumonia, bronchitis, asthma, pleurisy, chest cold or grippe without first considering the possibility of tuberculosis. The symptoms and physical findings in these cases may be the same as those in tuberculosis. The most valuable physical finding in tuberculosis is the presence of râles. Only 57 (29%) of these 200 minimal cases had râles. This shows how unreliable a physical examination is in early diagnosis of minimal tuberculosis.

In 156 patients no tubercle bacilli were found. The demonstration of tubercle bacilli is proof of tuberculosis but a negative sputum does not mean that tuberculosis is absent. White cell count and sedimentation rate were of little help. The tuberculin test was not used. Fluoroscopy as a diagnostic means is much less accurate than radiography.

The main problem in the control of tuberculosis is that of early diagnosis and early treatment. The physician has the duty to educate the patient and his family in the infectiousness of the disease and to convince them of the value and necessity of immediate care. The possibility of progression of the disease can then be avoided and morbidity and mortality of advanced tuberculosis thereby avoided.

The routine use of x-ray examination is an absolute necessity and a judicious economy. There is a much greater cost—to the patient, his family and the public—in a missed or delayed diagnosis of tuberculosis than in the expenditure for films that reveal no lesions.

L. M. SPRATT

Treatment of Pulmonary Tuberculosis with Diasone. Olson, K. B., Thompson, J. F. and Zintheo, C. J. Jr.: *Am. Rev. Tuberc.*, 52: 474, 1945.

The authors' report on the use of diasone on 10 cases of pulmonary tuberculosis using control cases of similar age and type of disease. All cases were given bed rest for a period of 119 days. Symptomatically, nothing unusual was observed beyond mild nausea early in the experiment and accompanying nervousness and transient headaches. Cough was thought to be reduced, particularly in two cases. Objectively, cases developed bluish discoloration considered due to development of methæmoglobin and sulphæmoglobin in the erythrocytes. Slight rise in temperature was observed in five cases early with two febrile cases showing exacerbations. Nothing significant was observed in body weight, urine examinations, or leucocyte count. A drop in red blood cells and hæmoglobin was observed early in the experiment with a gradual return to normal. All treated cases showed a drop in sedimentation rate which was maintained as opposed to no essential change in the controls. The results of sputum examination were not particularly informative.

Roentgenographic study after four months revealed that four of the treated cases were improved; two were unchanged; and three were worse. Of the control cases two were improved; two unchanged, and six worse. At ten months, the results in the two series of cases were considered comparable. In one case only of the six under treatment showing cavitation, was cavity closure observed.

The authors discuss their results and conclude that no marked beneficial effect could be attributed to diasone. It is emphasized that the natural evolution of the disease must be contended with in an experiment over a period as long as four months and to evaluate adequately chemotherapeutic agents in tuberculosis a trial of one to two months' time should be sufficient. Sterilization of sputum and rapid resolu-

tion of recent exudative lesions, also the closure of small cavities, are considered a minimal requirement in the specific treatment of tuberculosis. Most of the cases revealed exudative lesions, yet diasone, in the dosage used, did not appear to influence the cause of the disease beyond what might be expected of bed rest treatment alone.

J. B. ROBINSON

The Hereditary and Familial Aspects of Exophthalmic Goitre and Nodular Goitre. Martin, L.: *Quart. J. Med.*, 15: 207, 1945.

A group of 90 cases of exophthalmic goitre and another of 111 cases of nodular goitre were studied in regard to any familial or hereditary factors which might influence their occurrence. It was found that there was little tendency for the relatives of patients with exophthalmic goitre to be affected by simple goitre, and conversely that patients with nodular goitre, the outcome of simple goitre, have very few relatives with exophthalmic goitre. The conclusion was reached that there is inheritance of a recessive factor favourable to the occurrence of exophthalmic goitre. No evidence was found of an inherited trait in nodular goitre but this remains a possibility.

The suggestion is put forward that the inherited recessive factor in exophthalmic goitre may be a personality-type or a constitutional nervous instability.

NORMAN S. SKINNER

Surgery

Iliac-Bone Transplantation. Dick, I. L.: *J. Bone & Joint Surg.*, 28: 1, 1946.

Chips of cancellous bone from the ilium contain numerous cells which derive nourishment readily from the ingrowing vascular buds. The best source of such bone chips is the area of the ilium just lateral to the posterior superior spine. A rigid splint must be used when using these chips for grafting. By the 14th day fusion is usually fairly well advanced.

GUY H. FISK

Late Rupture of Extensor Pollicis Longus Tendon Following Colles' Fracture. Smith, F. M.: *J. Bone & Joint Surg.*, 28: 49, 1946.

Spontaneous rupture of the extensor pollicis longus tendon develops as a result of acute or chronic trauma. Sharp fragments from a Colles' fracture frequently produce attrition of the tendon as it rubs back and forth. Symptoms may be only a mild sensation of something giving way followed by inability to straighten the thumb actively. Patient is unable to lift the thumb up to a level with the other metacarpals. The distal phalanx of the thumb cannot be extended actively. There is absence of medial border of anatomical snuffbox. Rupture is usually at the level of the dorsum of the lower extremity of the radius.

Suturing the two ends of the tendons together gives rise to dense adhesions with a frozen tendon. The most satisfactory operative procedure is to suture the distal end of the extensor pollicis longus tendon to the extensor carpi radialis longus tendon by an end to side suture. Then the extensor pollicis brevis tendon is sutured to the extensor pollicis longus tendon at this point also. The suturing to the extensor carpi radialis longus tendon gives elevation to the thumb and the extensor pollicis brevis gives extension to the distal phalanx of the thumb.

GUY H. FISK

The Operative Treatment of Decubitus Ulcer. Croce, E. J., Schullinger, R. N. and Shearer, T. R.: *Ann. Surg.*, 123: 53, 1946.

Paraplegic casualties have made the old approach to the treatment of decubitus ulcer inadequate. First, attempts were made at covering clean ulcers with free grafts but these proved unsatisfactory. Next, covering of the ulcerated area by local flaps was attempted. This has proved a satisfactory method of treatment. It is necessary that the patient has re-

covered from spinal shock, have a distinctly positive nitrogen balance for several weeks; the ulcer must be free from acute inflammation and its margin fixed and circumscribed with invading epithelium and the ulcer must be free of *S. haemolyticus* and *Staph. aureus* before operation is undertaken.

Preoperatively the patient is given a high caloric, high protein, high vitamin diet. Plasma, blood and amino acid infusions are used when indicated. While sloughing is present daily penicillin (250 units to the c.c.) doses are used. Thereafter, five-mesh gauze dressings impregnated with a little xeroform ointment are applied daily after dusting the granulations with plasma-penicillin powder.

Most patients do not require anaesthesia. The ulcer is completely excised. The raw area is closed by approximating two sector flaps on each side. Size of the flap varies with the shape of the defect. All scar tissue must be excised. Trauma must be avoided. Haemostasis must be meticulous. Fine nonabsorbable sutures must be used. Tension must be avoided.

Postoperatively, a pressure dressing is used. If necessary, penicillin is given for 4 or 5 days after operation, otherwise sulfadiazine is administered. The patient is placed in a Stryker frame four hours prone, and half hour supine. The dressing is not disturbed for 5 days as a rule. Alternate sutures are then removed. The remainder are removed in the next 5 days. Within a month the patient is receiving the same care as a similar patient without any history of ulcer.

STUART GORDON

Intussusception of the Vermiform Appendix. Ingersoll, F. M. and Meigs, J. V.: *Arch. Surg.*, 51: 172, 1945.

This lesion is of rare occurrence. There are three types of intussusception of the vermiform appendix: (a) simple, i.e., into itself; (b) the appendix invaginating into the caecum, either partial or complete, and (c) compound, i.e., the appendix invaginating into the caecum and the caecum into the ascending colon. The authors report a third instance of the single type of intussusception, being the third case so far mentioned in the literature. All other cases of appendiceal intussusception which have been reported were of the compound type. The symptoms are those of an acute appendicitis and the treatment of intussusception of the appendix into itself, is appendectomy.

G. E. LEARMONTH

Resection of the Lung in the Treatment of Pulmonary Tuberculosis. Brantigan, O. C.: *Arch. Surg.*, 51: 147, 1946.

Often in the later stages of pulmonary tuberculosis, irreversible structural changes occur in the bronchial system, thus causing the failure of simple therapeutic measures. Accurate diagnosis is extremely important in recognizing irreversible structural changes in the lungs and bronchial system. The use of tomography (sectional roentgenography), bronchography, determinations of intracavitary pressure, bronchoscopy, bronchspirometry and diagnostic pneumothorax as indicated, will lead to the correct diagnosis of pulmonary lesions. Only with an accurate diagnosis can the outcome of surgical treatment be predicted. The finding of tubercle bacilli in the sputum has long been insufficient for diagnosis. The unexpected good result or the discouraging poor result from a surgical procedure usually is contingent on an incomplete diagnosis or a misunderstanding of the nature of the disease. If the contralateral lung is free from disease, pulmonary resection appears to be the best instrument after the occurrence of irreparable damage, such as bronchial stenosis, bronchial disease with or without ulcerations not responding to bronchoscopic treatment, bronchiectasis and unsuccessful thoracoplasty. The mortality rate of pulmonary resection has been reduced to a reasonable level in the past few years by the improvement in operative and anaesthetic technique.

The author cites the histories with operative records of nine patients upon whom lobectomy was performed.

One patient died from shock and eight patients made good recoveries and the results were satisfactory.

Brantigan concludes that pulmonary resection for this disease is a relatively safe operation. The late end results are yet unknown. G. E. LEARMONTH

Obstetrics and Gynaecology

The Anovulatory Cycle and Menstruation. Meyer, R.: *Am. J. Obst. & Gyn.*, 51: 39, 1946.

The uterine bleeding called anovulatory cycle does not appear at a definite point in the cyclical changes of the follicle and the endometrium. Interruption of the cycle in either causes bleeding both in the early and in the late time of proliferative stage, and occasionally at any time in the luteal stage.

The similarities between true menstruation and the anovulatory cycle, namely the ischaemic necrosis and bleeding caused by the nonproduction of hormones, are superficial when compared with the fundamental differences. These latter are stipulated by the revolutionary hormonal, chemico-functional, and morphological preparations of the endometrium for pregnancy. These preparations in the primate differ from those in the lower mammals, because they must be adapted to very different types of placentation. For this reason the regression of the endometrium when fertilization does not occur must necessarily also be fundamentally different, so that one cannot relate oestrous bleeding to menstruation.

The fact that the experimental biology and gynaecology consider the problem from entirely different angles gives rise to their opposing positions. Because the gynaecologist thinks in terms of ultimate ends, he will not allow the term menstruation to stand for anything except that which has been traditional. It is the symbol of sexual maturity and potential fertility. Without corpus luteum there can be no pregravid phase, without which there is no true menstruation.

ROSS MITCHELL

Pædiatrics

Congenital Anomalies Following Maternal Rubella in Early Weeks of Pregnancy. Albaugh, C. H.: *J. Am. M. Ass.*, 129: 11, 1945.

That rubella and perhaps other exanthematous diseases occurring in a mother early in pregnancy, may be followed by the development of congenital anomalies in her baby, was brought to public notice by Gregg in 1942. This observation was soon supported by the findings of Swan and associates, working under the authority of the National Health and Medical Research Council of Australia, and afterwards by other investigators.

The preceding virus infection is nearly always rubella, coming on usually within the first three months of pregnancy. If it occurs within the first two months, the incidence of abnormality in the offspring is 100%; if delayed until the third, about 50%. The anomalies most likely to result are cataracts and other optical defects, cardiac abnormalities involving the septa and ductus arteriosus, microcephaly, deafmutism, and retarded development. There are often feeding difficulties.

The author describes a series of 9 cases; in 7 the mother had rubella, in 1 morbilli, and in the remaining one there was exposure to morbilli. All the infants had congenital defects of some kind and signs of retarded development. Most, presented feeding problems. Bilateral cataracts occurred in 8, and some had other optical anomalies, such as strabismus; 8 had heart lesions; septal or relating to the ductus arteriosus; 5 were definitely microcephalic; 1 had pyloric stenosis and undescended testicles, and 1 an umbilical hernia. Two infants died: one from cardiac decompensation and pneumonia, the other from cardiac failure.

The author considers that "although at the present stage of knowledge any hypothesis would be purely

speculative, it would seem likely that either one or both of two processes is responsible for the lenticular lesions". One is the susceptibility to virus attack of undifferentiated embryonic tissue; lens tissue differentiation begins during the 8th week. The other is linked to the fact that the lens is an ectodermal structure; ectodermal tissues are apparently open to attack by the virus of rubella. Note is made of Hurst's suggestion that anomalies may result from faulty nutrition, caused by vascular disturbances due to the virus or its products.

As the risk to the fetus is so great, the idea has been advanced by some that artificially induced abortion might be justified, but this is open to grave objection on legal, religious, and other grounds.

The importance of further extensive statistical study is stressed, to confirm the findings "as fact rather than as coincidence". R. CAMERON STEWART

Pathology

Fibrocystic Disease of the Pancreas. Report of 14 Cases. Baggenstoss, A. H. and Kennedy, R. L. J.: *Am. J. Clin. Pathol.*, 15: 64, February.

This very interesting report indicates that the physician who says he never sees any inherited diseases is probably meeting them but not recognizing them. In one of the cases here reported, there was a history of five children in the family dying of whooping cough under 5 months of age. This unusual circumstance alone should have caused the physician to ponder on the accuracy of his diagnosis. The sixth child who died with a dry, brassy cough before five months of age was autopsied, and found to have congenital bronchiectatic lungs and fibrocystic pancreas. There is no doubt that the other five died of the same condition. Three other children in the family were normal.

Of the 14 cases here reported, 8 were the only child in the family, therefore there was no opportunity for familial occurrence; 3 cases had siblings who were well, and the remaining 3 cases had other siblings affected with the same condition. In the second family 2 of four children were proved to be affected at autopsy, and in the third family the only 2 children were affected. Such a group of families would suggest that the disease was definitely due to an inherited factor, and it probably is due to a recessive factor.

MADGE THURLOW MACKLIN

Hereditary Clubbing of the Fingers in Two Families. Davis, E.: *Brit. M. J.*, 1: 128, 1946.

Clubbing of the fingers has been associated with chronic pulmonary disease, but it may appear as a hereditary abnormality without any associated pulmonary lesions. Two families are reported; one in which the defect had lasted through five generations, one in which it had affected only two. It had descended in the direct line in the first family, acting as a dominant character. In the second family the first person to be affected was a woman whose parents and the five younger and five older brothers and sisters were normal. This would suggest that the defect had arisen in her as a mutation. Her identical twin boys and her other two children were similarly affected. In the first family webbing of the toes had been present in the affected as well as in many normal persons.

MADGE THURLOW MACKLIN

Hepatolenticular Degeneration. Homburger, F. and Kozol, H. L.: *J. Am. Med. Ass.*, 130: 6, 1946.

These authors report four cases of this disease, all of which had been misdiagnosed as parkinsonism, psychoneuroses or multiple sclerosis. The authors found the Kayser-Fleischer ring in all four patients, and made the diagnosis of hepato-lenticular degeneration. The first family had all three children affected, the identical twin boys of 18 and the daughter of 19.

The parents were Jews and were first cousins. One of the twins died at 18.

The second family had one man affected, and his parents were first cousins once removed. There were two other instances of mental deficiency in the family. The first generation had consisted of three brothers. A son of A married a granddaughter of B and had the affected patient of the report. C, the third brother had a mentally defective boy, and his daughter married the second son of A. Their son's son also had mental deficiency.

This disease, which is rare, behaves as a recessive, affecting children of parents who are themselves normal.

MADGE THURLOW MACKLIN

Oto-Rhino-Laryngology

Determination of Intranasal pH. Parkinson, S. N.: *Arch. Otolaryn.*, 41: 68, 1945.

Within the nasal chambers are two distinct sources of hydrogen ion concentration: living tissue and non living secretion. Living tissues are perfused with body fluid, the physical properties of which are maintained at nearly constant values. The term "body fluid" embraces both cellular and extracellular fluids which maintain identical physical characteristics (total salinity, the pH and the temperature). Nasal secretion is non-living and maintains no physical standards as temperature, hydrogen ion, concentration and tonicity which change with every breath. Nasal mucous membrane being living tissue, maintains its standard physical values. Nungester and Atkinson, by employing an intranasal electrode which contacts both nasal secretion and mucous membrane, concluded that their determinations of pH indicate a neutral or slightly alkaline state in normal persons as well as in those with acute rhinitis. Fabricant reported low pH values that he considered as a purposeful acid barrier against infection. The temperature of nasal secretion is changed *in situ* by nasally respired air through contact and evaporation; the osmotic pressure is changed through evaporation and concentration; the hydrogen ion concentration is changed by two factors: absorption of CO₂ with decrease of pH, proteolysis with increase of pH. The author feels that these changes cannot be interpreted as necessarily purposeful; they indicate, if anything, the tolerance of the nasal membrane to changes in external environment. Intranasal treatment is treatment of mucous membrane, it is not treatment of nasal secretion.

V. LATRAVERSE

Radiology and Physical Therapy

The Histological Effects of Radiophosphorus of Normal and Lymphomatous Mice. Graff, W. S., Scott, K. G. and Lawrence, J. H.: *Am. J. Roent.*, 55: 44, 1946.

Hamatological and histological studies on normal and lymphomatous mice which have been given radiophosphorus revealed characteristic effects on the hematopoietic tissues. Although a few animals recovered from generalized lymphomatosis after treatment with P³², no evidence of any increased radiosensitivity of the neoplastic cells was observed. The limiting factors in the use of roentgen irradiation and P³² in the therapy of leukæmia and allied diseases are discussed.

R. C. BURR

Studies on the Effects of Radioactive Sodium and of Roentgen Rays on Normal and Leukæmic Mice. Evans, T. C. and Quimby, E. H.: *Am. J. Roent.*, 55: 55, 1946.

The effects of radioactive sodium and of whole body roentgen irradiation on white mice have been compared. Results in reduction of white and red blood counts and in shortening of life are similar for the two types of radiation. It has been found that 10 microcuries of radioactive sodium per gram of body weight injected

subcutaneously in the normal mouse are equivalent in effect to 100 roentgens of heavily filtered 200 kv. roentgen rays. This ratio would not hold for the human; the same number of microcuries would be equivalent to a considerable higher number of roentgens.

Mice with enlarged nodes and extremely high leukocyte counts were found especially sensitive to the radio-sodium. They were not tested with roentgen rays. The marked response was apparently due to radiosensitivity of the abnormal leukocytes rather than to any selective concentration of the material in lymph nodes.

R. C. BURR

Hygiene and Public Health

Anæsthetic Complications and Their Management.

Monsel, L. H., Stubbs, D. and Kreiselman, J.: *Anæsthesiology*, 7: 69, 1946.

The authors point out that the transient complications of anæsthesia are all due to anoxia under one or another of the complicated mechanisms which produce it. Anæsthetic complications are essentially deviations from normal physiology. The extent of such deviations determines whether it results in a transient abnormal state during anæsthesia or in death on the operating table. The duration of upset physiology determines whether it leads to postoperative complication or delayed death. Anoxia may result from failure of adequate quantities of oxygen to reach the blood under four conditions common in anæsthetic practice.

1. The respired atmosphere may contain inadequate amounts of oxygen due either to the failure to eliminate nitrogen from the gas anæsthesia system or to the effort to use too high a concentration of anæsthetic gas for its more rapid effect.

2. Pulmonary ventilation may be deficient because of obstruction in the airway. Relaxation of soft tissues in the throat is the commonest cause of such obstruction but other serious causes are vomiting and laryngospasm.

3. Pulmonary ventilation may be deficient as a result of central depression of respiration, caused most frequently by overdosage of anæsthetic agent.

4. There may be interference with the function of the alveolar membrane as from œdema which is commonly present in some degree when there is anoxic increase in capillary permeability, obstruction to inspiration, or irritating fluctuations in ether concentration.

Even if none of the previous conditions exist, adequate quantities of oxygen cannot be held in anæmic blood. Normally oxygenated blood may not circulate adequately as in shock, and stagnant anoxia will exist. Thus it is safe to say that very few anæsthesias progress for more than a few minutes in average hands without some degree of anoxia under some of the aforementioned headings.

While anæsthetic complications are the result essentially of anoxia in their inception, they may branch out into definite directions if allowed to persist long enough to set the stage for postoperative continuity. They may then become rather definitely pulmonary, circulatory, metabolic, or cerebral complications.

Death under anæsthesia is much more frequent than is generally supposed. It varies, depending upon the skill of the anæsthetist, between 1 in 300 cases to 1 in 7,000 cases. The latter figure shows that it is no fortuitous accident that in good teaching hands death from anæsthesia and operation should occur so seldom, nor is it an unfair blow of fate that in the poorest type of anæsthetic organization death should come 20 to 25 times as frequently.

Almost all anæsthetic deaths, with the exception of chloroform and cyclopropane, are the result of an acute anoxia and can be prevented provided intelligent and vigorous measures are instituted at once. This means supplying oxygen to the tissues, which can be most simply and effectively done without loss of time by the application of the face mask of an ordinary gas machine accompanied by rhythmic and regular

insufflation of pure oxygen under moderate positive pressure. This is much more effective than any manual method of artificial respiration. No anaesthetic should ever be administered without such a source of oxygen under positive pressure ready at hand and in working order.

F. ARTHUR H. WILKINSON

Music While You Work. *Industrial Welfare and Personnel Management*, 27: 197, 1945.

That half an hour is the most suitable length of music program for industrial workers, that too little music is better than too much, and that a break of two hours should be allowed between music programs, were some of the points agreed upon at a discussion of music at work which took place at a small informal meeting, arranged by the Industrial Welfare Society. In connection with the question of uninterrupted music, some persons felt that it tends to increase monotony but it was pointed out that variety in the tunes chosen will overcome this. An interesting experiment was described by a firm employing many young people on piecework on sewing machines. To relieve monotony, the firm introduced headphones and allowed the employees to listen to any B.B.C. programs they liked, talks and music. The effect on output was good; in some cases the more inattentive of the workers increased their output by 25%.

In connection with gramophone programs, the need for monitoring to check the tone, was emphasized, also the need for checking records brought by employees. Establishment of committees to decide on the M.W.Y.W. (Music While You Work) programs seems to be wise. In one firm a committee consisting of a representative from each floor of the factory, presided over by the Works Superintendent, meets every Monday morning for half an hour. The program is chosen from the *Radio Times* and from the company's records, the records being given in order, to the girl who is to operate the recording machine. Technical points in connection with installation, were considered. In the experience of those present, for good level and tone, many small speakers in the factory are much better than a small number of large speakers.

MARGARET H. WILTON

A Fatal Case of D.D.T. Poisoning in a Child, with an Account of Two Accidental Deaths in Dogs. Hill, K. R. and Robinson, G.: *Brit. M. J.*, 1: 845, 1945.

In this article is presented a detailed record of a fatal case of poisoning in a child after ingestion of D.D.T., together with a description of the death of two dogs following skin absorption of that substance.

On August 22, 1945, at 11 a.m., the child, a boy aged 1 year, 7 months, found a bottle of 5% D.D.T. in kerosene and drank about 1 oz. Within 10 minutes he began to cough and vomit violently. Neighbours gave him palm-oil. The coughing and vomiting ceased but his general condition became worse until at about 12.30 p.m. he became comatose and had convulsions. These consisted of generalized fine tremors. At 1.30 p.m. he was observed to be "comatose and collapsed, with no perceptible pulse, and had froth at the mouth". Atropine was given and the stomach washed out. Artificial respiration was applied but the child died at 3 p.m., death being due to respiratory failure.

Details of post-mortem examination and histology are given, together with an account of experiments conducted on baboons to prove that death was due to D.D.T. rather than to the kerosene. The amount ingested by the child was fairly accurately deduced and suggests a lethal dose of about 150 mgm./kg. body-weight.

The two dogs were sprayed once with 5% D.D.T. in kerosene. Subsequently they became very ill and showed the signs of chronic poisoning, consisting of loss of appetite and weight and poor health. They died from exhaustion about two months later. Examination showed death to be the result of chronic toxæmia leading to liver and kidney damage. This would suggest that D.D.T. dissolved in organic solvents appears to be easily

absorbed through the skin and may prove dangerous though observations of previous investigators would indicate little danger from the use of the powdered form or of watery suspension.

MARGARET H. WILTON

OBITUARIES

Dr. George S. Burt, who for more than 45 years had practiced in Owen Sound as an eye, ear, nose and throat specialist, died March 1, at Toronto Western Hospital.

Dr. Burt, was a graduate in medicine from the University of Toronto in 1896, and a member of the class recently honoured when the degree of M.D. was conferred by the university. Dr. Burt had anticipated being present to receive the degree but was prevented by illness.

Born at Erin, he received his early education in local schools. He took postgraduate work in ear, eye, nose and throat in England, and following his return to Canada, established a practice as a specialist in Owen Sound.

Dr. John Joseph Cameron died on March 1 at his home in Antigonish. He was born at Salt Springs, Antigonish County, on August 14, 1861. Graduating from Saint Francis Xavier University, he became principal of Saint Mary's High School, Halifax, in 1882. Besides teaching he took preliminary classes in Medicine at the Halifax Medical College. Leaving in 1885 he entered Bellevue Hospital Medical College, New York, where he graduated in 1889. After an internship at the Victoria General Hospital, Halifax, of eighteen months duration, he returned to Antigonish where he practised his profession thereafter.

He was possessed of great physical strength, and a rugged physique was necessary to sustain the rigours of practice in the earlier years. He was continuously associated throughout his life with any movements to promote the welfare of the public and the medical profession. He was one of a group instrumental in the foundation of Saint Martha's Hospital, Antigonish. For 26 years he was a member of the Provincial Medical Board; was past president of the Medical Society of Nova Scotia and of the Nova Scotia Health Officers Association. For many years he was County Health Officer. In politics he was a conservative, contesting his constituency in one Provincial by-election and in the Federal general election of 1911.

Dr. Robert John Carson, Orillia, Ontario, died on December 25, 1945. He was born in 1870 and was a graduate of Trinity College (1905).

Dr. William Harry Carson, Southampton, Ontario, died on December 18, 1945. He was born in 1901 and was a graduate of the University of Toronto (1926).

Dr. Lewis James Carter died on February 19 at his residence in Brandon. Born in Huron County, Ontario, January 25, 1874, he moved with his mother to Winnipeg at an early age. After graduating in Arts from Wesley College in 1899, he entered Manitoba Medical College and received his M.D.C.M. degree in 1903. For some years he practised at Boissevain, then moved to Brandon and became a member of the Bigelow Clinic at its foundation in 1915.

For a quarter of a century he specialized in the field of radiology. He was a Fellow of the American College of Physicians, a member of the Radiological Society of North America, Fellow of the American College of Radiology, and held a certificate in Diagnostic and Therapeutic Radiology from the Royal College of Physicians and Surgeons of Canada. Dr. Carter was a member of the First Church United of Brandon. In his college days he played football and later was a member of the

Brandon Golf and Country Club, and an ardent hunter and fisherman.

He is survived by his widow and one son, Lieut.-Commander A. Bruce Carter, R.C.N.V.R. of Winnipeg.

Dr. George Fraser Cliff, prominent physician, formerly of Kingston, died at his home in Burwash, January 26.

Dr. Cliff was born on May 5, 1877, at Carleton Place. After graduating from Carleton Place High School, Dr. Cliff spent some years with the *Toronto Mail* before entering Queen's Medical College. He graduated from Queen's in 1906 and practised at Mortlach, Sask., until 1928 when he returned to Kingston. In 1942 he became resident physician at Burwash Reformatory.

He is survived by his widow, one sister, four sons, and three daughters.

Dr J.-H. Garceau, ex-échevin, père du Dr Eugène Garceau, chef de service en dermatologie à l'hôpital Saint-Luc, est décédé le 6 février à l'âge de 85 ans.

Né à Pointe-du-Lac il avait poursuivi ses études classiques au séminaire de Trois-Rivières et ses études médicales à l'université Laval de Québec et à l'école de médecine Victoria, à Montréal. Il avait commencé à pratiquer la médecine dans la paroisse de la Nativité (Hochelega) dont il avait été marguillier et commissaire d'école. En plus d'être échevin de Montréal de 1910 à 1914, il s'était intéressé vivement aux assurances mutuelles alors naissantes, soit les Artisans canadiens-français, l'Alliance nationale, les Forestiers catholiques dont il avait été le médecin-chef pour la province de Québec pendant vingt ans.

Outre son fils, il laisse son épouse et une fille.

Dr. W. Russell Gorrell, provincial coroner since 1942, died suddenly at his home in Winnipeg on February 8. Born in Pilot Mound, Man., he was employed by the J. I. Case Threshing Machine Company for four years. He graduated in medicine from the University of Manitoba in 1915, and practised for twelve years in Minnedosa before coming to Winnipeg. For some time he acted as deputy coroner, and on the retirement of Dr. H. M. Speechly succeeded him as coroner. In this position he rendered excellent service. He held the rank of Major in the R.C.A.M.C. (reserve). Dr. Gorrell was keenly interested in music and curling and was a past president of the Granite Curling Club. He is survived by his widow and a sister and five brothers, one of whom is Dr. J. A. Gorrell, of Vancouver.

Dr. Gordon Cameron Gray died in Edmonton on February 12. He was 61 years old.

Dr. Gray was born in Lambton County, Ont., on October 16, 1884. He received his pre-university education at Sarnia Collegiate. In 1907 he was graduated from the University of Toronto with a bachelor of medicine degree. He was also a gold medal winner in his class.

Following his postgraduate work in surgery which he studied in New York, he toured Europe and spent one year visiting London, Vienna and Paris. On his return to Canada he came out west and opened his practice in Edmonton in 1913. He later became president of the Medical Academy in Edmonton. Dr. Gray was an active member of the Shriners' club in the city and a member of Robertson United Church.

For the 1916 to 1917 term at the University of Alberta, Dr. Gray and Dr. W. A. Wilson became the first two doctors ever to teach surgery in Alberta. And up until the time of his death, Dr. Gray held the position of clinical professor of surgery.

Dr. Gray was a fellow of the Royal College of Surgeons of Canada, and a fellow of the American College of Surgery.

Always interested in athletics, he was an ardent patron of tennis, hockey and other sports. Also he was unwavering in his support of music and other arts, and

on frequent occasions visiting singers and instrumentalists were entertained at his home.

Surviving are his widow and three sons.

Dr. James Norman Harvie, Orillia, Ontario, died on March 3. He was a graduate of the University of Toronto (1893).

Dr. Philip H. Huyck, of Kingston, Ont., died recently of a heart attack. He had been in failing health the past two years. Born at Dartford, Ont., he resided about 25 years in Kingston. He had been retired from active practice for the past eight years.

In 1927-28, he was president of the Rotary Club of Kingston, and was District Governor of Rotary in 1937-38. He was past president of Kingston Motor Club, and a past president of the Ontario Motor League. Dr. Huyck was at one time president of the Kingston Boy Scouts' Association, a member of the Ontario Synod, and was active in the Kingston Community Chest. He was a graduate of Queen's University.

Dr. Charles Landon, McGill medical graduate, died on March 9.

Dr. Landon was born in Canterbury, New Brunswick, in 1891. After receiving his early education there he entered Mount Allison University at Sackville, N.B., and from there proceeded to McGill where he received his M.D., C.M. in 1914. After this he interned at the Long Island College Hospital, Brooklyn, N.Y. He practised for a time at Canterbury and then entered the Canadian Army Medical Corps.

He then began lengthy postgraduate studies. He spent three and a half years at Bellevue Hospital, New York, specializing in urology. He returned to Montreal in 1922 and was appointed to the staff of the Royal Victoria Hospital, where he served until the time of his death. He was later appointed to the urological staff of St. Mary's Hospital. He served for a number of years as the senior medical officer to the U.S. Consulate here, and was also senior medical officer of the Montreal Dispensary, Canadian Red Cross Society.

He is survived by his widow, one son, John Landon, of Montreal; one brother, Dr. A. E. Landon, of Montreal; and two sisters.

Dr. Frederic J. McCammon, aged 77, who practised in Brooklyn as an ear, nose and throat specialist until he retired in 1943, died at Huntingdon, L.I., on February 3. Dr. McCammon was a native of Kingston, Ont., and graduated from Queen's University medical school in 1894.

Dr. Charles Franklin Magee died recently in Moscow, Idaho. Dr. Magee was born at North Gower, Ontario, August 13, 1874, and graduated from McGill Medical School in 1903. After practicing in Carp, Ont., he joined the large emigration to British Columbia about 1912. He was practicing in Vancouver at the outbreak of the First World War, and joined up with the R.C.A.M.C., serving in Britain and in France.

After postgraduate training in Vienna he returned to Vancouver, leaving soon afterwards to take over the Inland Empire Hospital in the university city of Moscow, Idaho. For over twenty years he carried on a large surgical practice in that community and became interested in purebred livestock raising at his farm at Genesee, Idaho. He maintained his connection with the Canadian Medical Association throughout his professional career and was looking forward to the Banff meetings at the time of his death in February from cerebral hæmorrhage.

Dr. William Malcolm, aged 85, former Presbyterian medical missionary in China, died at his home in New York, February 19. A native of Galt, Ont., Dr. Malcolm graduated from the University of Toronto and first went to China in 1892 where he served until

the Boxer rebellion in 1900. He returned to China in 1910 and remained there until his repatriation in 1943.

Dr. John Daniel McEachern died February 17 at Misericordia Hospital after a long illness. Born in Newport, Prince Edward Island in 1883, he attended St. Dunstan's College in Charlottetown, then came west in 1904. Before entering the study of medicine, he taught school for two years. In 1912 he graduated from Manitoba Medical College and later took post-graduate work in New York and Paris. In his practice in Winnipeg he was known as an expert surgeon possessed of good judgment. He became chief of surgery both in Misericordia and the Children's Hospital and was consultant surgeon to the city hospitals, King George and King Edward. He was assistant professor of surgery in the Faculty of Medicine, University of Manitoba, until ill-health caused his retirement in 1941.

Honours came to him. He was past president and honorary life member of the Winnipeg Medical Society, a past Honorary President of the Manitoba Medical Student's Association and a Fellow of the American College of Surgeons.

He is survived by his widow, a son and daughter.

Dr. Georges-Hector Martineau, directeur des Gouttes de Lait paroissiales, ancien organiste et marguillier de la paroisse St-Anselme, est décédé subitement, le 18 février, à Montréal.

Né à Lavaltrie, le 5 avril 1885, le Dr. Martineau fit ses études au collège de l'Assomption (65e cours) et à l'université Laval de Montréal, où il fut admis à la pratique de la médecine le 11 juin 1909.

Il laisse dans le deuil, son épouse, deux filles et cinq fils.

Dr. Angus Allan Murray died on February 9, at the Winnipeg General Hospital. Born at Lower Mount Thom, Pictou County, N.S., he was educated in Pictou Academy and taught school in Nova Scotia before coming to the west. He graduated from the Faculty of Medicine, University of Manitoba, in 1913 and received the C.M. degree in 1922. Later he became a Fellow of the American College of Surgeons and a Fellow of the Royal College of Surgeons of Canada.

For four years after leaving the Winnipeg General Hospital he practised orthopaedics with the late Dr. H. P. H. Galloway. On the institution of the Shriners' Hospital for Crippled Children in Winnipeg he became orthopaedic surgeon. From 1920 to 1935 he lectured in orthopaedic surgery in the Medical School. In 1926 he travelled through Saskatchewan as a lecturer under the C.M.A. postgraduate scheme.

Two sons and a daughter survive him. Intensely devoted to his work, he had a warm heart for the crippled and afflicted, especially children.

Dr. A. G. Nicholls, M.A., C.M., D.Sc., F.R.S.C., F.R.C.P.[C.], died on March 3 at his home, in his 76th year, bringing to a close a distinguished career as a medical research worker, public health worker, teacher and writer.

A native of Shotley Bridge, Durham County, England, he came to Canada as a boy and received his early education in Montreal, graduating from the Montreal High School as dux with the Davidson gold medal and the Lansdowne silver medal.

He entered McGill University and after obtaining his B.A. with the Chapman gold medal in classics, started his studies in the medical faculty where he graduated in 1894 with the Final Prize.

He did postgraduate work in Germany and Austria and won upon his return a D.Sc. degree from McGill. He was appointed assistant pathologist at the Royal Victoria Hospital and pathologist at the Western Division of the Montreal General Hospital, as well as assistant professor of pathology and bacteriology at McGill University.

He left Montreal in 1914 to take over the post of professor of pathology at Dalhousie University, and was appointed provincial pathologist for Nova Scotia. He returned to Montreal in 1925 and became editor in 1929 of the *Canadian Medical Association Journal*. He retired in 1943 and was made emeritus editor.

During the first Great War he served as deputy assistant director of medical services for Military District 6 at Halifax, where he was also a physician at the Military Hospital.

He became widely known as a writer on medical topics, and was co-author with Professor J. S. Adami, of a textbook on "The Principles of Pathology", and also wrote extensively in the realm of medical history.

He is survived by his widow, formerly Miss Lucia Pomeroy Van Vliet, and three sons, George V. V. Nicholls, lawyer; Dr. John V. V. Nicholls, and Robert V. V. Nicholls, assistant professor of chemistry at McGill.

Dr. Joseph-Eugène Prévost, qui exerçait sa profession depuis 50 ans dans la paroisse St-Louis-de-France, Montréal, mourut le 17 février à l'âge de 72 ans, après une longue maladie.

C'était un ancien marguillier de sa paroisse, un membre de la société St-Vincent de Paul et de la Fraternité St-Joseph des tertiaires franciscains, de la Société Médicale de Montréal et de la Ligue des propriétaires. Il était aussi gouverneur à vie de l'hôpital Notre-Dame.

Il laisse trois fils et six filles.

Dr. William Rogers, well remembered as a teacher of clinical medicine and for many years physician at the Royal Alexandra Hotel, Winnipeg, died on February 2 after a long illness. Born at Lakefield, Quebec, in 1866, he graduated in Arts and Medicine (1892) from McGill University, and came to Manitoba soon after graduation. He practised at Melita, then came to Winnipeg about ten years later.

He served on the honorary attending staff of the Winnipeg General Hospital from 1904 to 1927 when he was appointed to the consulting staff. In the Manitoba Medical School he lectured for seven years on Medical Jurisprudence and for fifteen years on Clinical Medicine. In 1929 he was appointed Professor Emeritus of Medicine. He was active in the Medical Council of Canada and was a delegate to its first assembly.

He was a brother of the late Hon. Robert Rogers, a former Minister of the Interior. Wise, urbane, and rich in saving common sense, he won the respect of his confrères and the admiration of his students.

Dr. William Ross Stone, aged 57, Vanderhoof's only medical doctor, died at his home there January 27, after a month's illness.

Dr. Stone, a pioneer resident of Vanderhoof, was born in Manitoba and attended schools in Vancouver before entering McGill for his medical degree.

Survivors include his widow and three daughters.

Dr. James A. Sutherland, one of the oldest practitioners in Vancouver, died recently at the age of seventy-six. Doctor Sutherland's name was up to be voted on for Senior Membership in the Canadian Medical Association. He was extremely popular with all his fellows in the profession, and his loss will be deeply felt.

Dr. Wesley Patterson Walsh was accidentally killed in a hunting accident at Beattie Anchorage, Queen Charlotte Islands, B.C., on January 29.

Dr. Walsh had just finished his term as doctor in charge of the Hospital at Beattie Anchorage, Queen Charlotte Anchorage, and had decided to go on a final hunting trip on the island before returning to practice with his father in Vancouver, when the unfortunate accident occurred.

He is survived by his widow, and a daughter.

Dr. Walter Davidson Wiley died in the Brantford General Hospital, Brantford, Ont., February 6, in his seventy-sixth year.

Dr. Wiley was born in Middlesex County. He has been a resident of Brantford since 1905. For the past ten years, Dr. Wiley was Medical Officer of Brantford public schools, retiring at the end of 1945. He was much interested in public life, serving Brantford as Alderman for Ward Four in 1916 and 1917 and being a former member of the Parks Board. He is a life member of the Arrowdale Golf Club.

He was active in Zion United Church, being a member of the Session. One of the city's keenest lawn bowlers, he had belonged to the Heather, Pastime and Dufferin Club. A Past Master of Doric Lodge, A.F. and A.M., he was also a member of Gore Lodge, I.O.O.F., the Woodmen of the World and the Canadian Order of Foresters. He was a former member of the Brantford Lions Club, being its first President. A lifelong Liberal, he took an active interest in the Brantford Association.

He is survived by a daughter.

Dr. David E. Winter, of Ottawa, suffered a seizure while driving to answer a professional call on February 26; he halted his automobile but died before help could reach him. He was 68 years of age. Former medical superintendent of Grace Hospital in Ottawa, Dr. Winter was a native of Lachute, Que., and a graduate of McGill University in 1901. He was well known in district medical golfing and curling circles.

Dr. O. C. J. Withrow died in a Toronto hospital, February 5, after collapsing from a heart attack in a local radio station.

Dr. Withrow was the chief figure in one of the most famous trials in Canadian history in 1927 when he was charged with manslaughter and found not guilty, but found guilty on a reduced charge and sentenced to seven years in prison.

On his release from prison, Dr. Withrow wrote a series of newspaper articles based on his experiences in penitentiary and called for a royal commission on treatment of prisoners and the whole penal system in Ontario.

A native of Woodstock, Dr. Withrow was a Fellow of the Royal Society of Surgeons of England and a former lecturer at the University of Toronto. In the first Great War he enlisted as a medical officer and served overseas.

Dr. Withrow graduated from the University of Toronto in 1902. In his early years Dr. Withrow practised in Fort William, coming to Toronto in 1913.

He is survived by his widow, a son and two daughters.

NEWS ITEMS

Alberta

Dr. Gordon Patton, formerly associated with the Lamont Clinic, has taken over the practice of Dr. R. E. Johnston, of Edson. Dr. Johnston has practised in Edson about twenty years.

The Alberta Division of the Canadian Medical Association will hold their annual business meeting in Banff at 2.30 in the afternoon June 11, 1946. This meeting will be followed immediately by the annual business meeting of the College of Physicians and Surgeons.

The President-elect of the Canadian Medical Association, Alberta Division, **Dr. Harold Orr**, of Edmonton, will visit the various medical districts in the Province during the month of May. He will be accompanied by **Dr. Max Cantor**, associate professor

of bio-chemistry, University of Alberta; **Dr. Walter C. McKenzie**, surgeon, Edmonton, and the Registrar of the College of Physicians and Surgeons, **Dr. W. Bramley-Moore**. The tentative dates of the tour are: Edmonton rural, during the week of May 13; Wetaskiwin-Camrose, May 23; Medicine Hat, May 27; Lethbridge, May 28; Calgary rural, May 29; Drumheller, May 30; Red Deer, May 31; Peace River, June 3.

G. E. LEARMONTH

British Columbia

The Osler Dinner of the Vancouver Medical Association was held on March 5, at the Hotel Vancouver. This is the occasion of the annual Osler Lecture, which has been an institution in the Association since 1921. The lecturer this year was **Dr. Arthur L. Lynch**, McGill Medical class 1903, who brought to the task an intimate knowledge of the great man of whom he spoke, and an excellent delivery. The subject of his lecture was, "Sir William Osler and Some of His Contemporaries" and at the conclusion of his more formal remarks Doctor Lynch showed a series of pictures of the great men who had influenced Osler's life and career. The lecturer made running comments as these were shown and held the keenest attention of his audience.

During the evening the conferring of the Prince of Good Fellows degree (P.G.F.) took place. This is the most highly esteemed honour which can be conferred by the members of the Association on its fellows, as the recipient must in the words of the degree have rendered eminent service to the Association, to his fellows, and to the City as a whole. The recipients this year were Doctors W. L. Pedlow and W. T. Ewing, and it was felt that the choice of these two men was an admirable one.

The question of the Medical Faculty is now becoming more active, and the current meeting of the Legislature is expected to deal with it. It is probable that steps will be taken this year to start the pre-clinical courses with a view to the subsequent clinical years two or three years from now. The uncertainty and difficulties of building and things generally are, of course, the lion in the path. The pre-medical students at the University of British Columbia are leaving no stone unturned to keep the importance of this matter before the public and the Government in Victoria.

The question of hospital shortage is as everywhere in Canada, becoming more and more acute, and determined efforts are being made both by hospital authorities and by the medical men themselves, to find some way of alleviating the hardships caused by this. A suggestion is being made by the Vancouver General Hospital authorities which will modify the training of nurses in such a way as to produce a type of nurse who could do household nursing safely and more economically than can be done by the trained nurse. It is of interest to note that at the beginning of this experiment, of forty girls taken into training, thirty were in full employment within a week or two of the completion of their short course, and the need for such nursing is very great. The shortage of nurses greatly aggravates and complicates the whole question of hospitalization, since even if extra beds can be obtained there is simply not enough personnel to staff them. Other steps being taken are the urging of the medical profession to speed up the discharge of patients and to reduce the time spent in bed.

Plans for the annual meeting at Banff are going ahead and attempts are being made to secure special trains from the coast to Banff. If this can be done it will be of great assistance in securing transportation and accommodation generally.

The Canadian Anæsthetist Society (B.C. Division) has recently been organized in British Columbia with

headquarters in Vancouver. Dr. H. Bruce MacEwen is secretary of this society.

The following medical officers have returned from service overseas, and have received their discharge: Lieut.-Col. J. L. M. Anderson, of Victoria; Wing Commander B. T. H. Marteinsson, Vancouver; Major J. E. Walker, Vancouver; Major Gordon Kirkpatrick, Vancouver; Lieut.-Col. S. G. Kenning, Victoria; Major D. B. Roxburgh, Victoria; Capt. L. L. Ptak, Victoria; Squadron-Leader J. L. Parnell, Vancouver; Major G. L. Stoker, Dawson Creek.

At the meeting of the Prince Rupert Medical Society held recently, the following were elected to office: Dr. W. S. Kergin, President; Dr. J. A. MacDonald, Secretary; Dr. R. G. Large, Representative to Board of Directors of the British Columbia Medical Association.

A nutrition survey, designed to help find those sections of the population needing improved nutrition, will be undertaken in British Columbia during the next six weeks. This is the first survey of its kind to be carried out anywhere in the world and is being made under the joint auspices of the Provincial Board of Health and the Federal Department, with the active participation of the Metropolitan Health Unit of Vancouver and of the nutrition services of the B.C. Red Cross Society. J. H. MACDERMOT

Manitoba

A total of 65,384 persons in Manitoba were x-rayed for tuberculosis in 1945. Of these, one in 1,143 had active pulmonary tuberculosis discovered for the first time, one in 481 had inactive tuberculosis, and one in 339 had disease either active or inactive. Clinics were held in 44 centres. The Central Tuberculosis Registry reports a total of 287 tuberculosis deaths in 1945, 181 white people and 106 Indians, but the latter figure may be increased. The death rate for Indians is 30 times greater than for whites.

The Christmas Seal sale receipts for 1945 were the largest of any year and exceeded those of 1944 by 14%. The 1946 budget for expenditures from this fund calls for a complete new x-ray survey unit, \$22,424.79; portable x-ray equipment for travelling clinic, \$1,852.70; travelling clinic trucks \$4,500; garage to house trucks and mobile unit, \$4,000; and equipping of dark room for travelling clinic use \$1,000.

ROSS MITCHELL

New Brunswick

His Majesty the King, the sovereign Head of the Grand Priory of the Order of Saint John of Jerusalem has conferred the Rank of Knight of the Order on Dr. W. W. White of St. John. This is the highest award in the order. Dr. White has been president of the New Brunswick Division of the St. John Ambulance Association for many years.

Dr. Norman Skinner, until recently Chief of Medicine at Sussex Military Hospital has been demobilized and before resuming practice in Saint John, intends doing intensive study in internal medicine at Boston and New York.

The Board of Trustees of the Moncton City Hospital announce that they plan to proceed at once with the construction of a new \$800,000.00 hospital building.

At the annual meeting of the N.B. Division of the Red Cross Society, Dr. L. DeV. Chipman was re-elected President.

Dr. H. Douglas Reid, Superintendent of the D.V.A. Hospital at Lancaster, N.B. has received the Vote of Thanks of the Commander of the Venerable Order of the Hospital of St. John of Jerusalem, for long service in this order.

Dr. A. B. Walter, Medical Consultant at Lancaster Hospital D.V.A. was the guest speaker at the monthly meeting of the Saint John Medical Society. His subject was "Proteins in Hospital Diet". A large gathering enjoyed the presentation and discussion was active and interested.

Wing Commander J. G. Turner until recently P.M.O. Eastern Air Command has been demobilized after five years service with Air Force Medical Services. He is at present taking a course at the School of Hospital Administration, Columbia University. A. S. KIRKLAND

Nova Scotia

Dr. D. C. P. Cantelope, recently discharged from the Services, has opened a practice in Lunenburg.

Dr. J. D. McFetridge of Middle Musquodoboit, recently discharged from the Services, is planning to practice in Dipsbury, Alberta.

Dr. S. Y. Shirley will shortly begin practice in Shelburne.

The many friends of Dr. J. F. Hiltz, recently appointed superintendent of the new Provincial Hospital in Shelburne, will regret to learn that in a recent car accident he had the misfortune to fracture his clavicle.

A new Department of Veterans' Affairs Hospital has recently been opened at Point Edward, Sydney, N.S. in the building formerly occupied by the Royal Naval Hospital. Mentioned as members of the medical staff are Dr. H. R. Ross of Sydney and Dr. J. F. Bates, formerly of Glace Bay.

Dr. J. C. Morrison of Halifax and Dr. W. W. Patton of Glace Bay have recently gone on cruises as ship's surgeons. During the absence of Dr. Patton, Dr. J. F. Nicholson is supplying in his practice.

H. L. SCAMMELL

Ontario

The Alumni of the University of Toronto Faculty of Medicine held a reunion dinner on February 21, in the Academy of Medicine. Nearly two hundred were present including many returned medical officers who were welcomed home. Dr. R. I. Harris gave an address on "The training of a surgeon" and Dr. Ray Farquharson spoke on "The training of a physician". Dr. Gallie, Dean of the Faculty also addressed the gathering.

Professor Graham and Professor Gallie conducted special clinics for the Alumni on the morning of February 22. Fifty doctors attended and their enthusiastic report will probably treble the number at the next convocation.

On February 22nd a convocation was held in the University of Toronto for the purpose of conferring degrees in medicine. One hundred and twenty men and eight women were admitted to the degree of Doctor of Medicine. With three or four exceptions all appeared in military uniform. The gold medal was won by Donald Armstrong Gibson and the silver medal by Theodore Yun Chang. This is the second time that a Chinese student has won first class honours and a silver medal on graduating from the Faculty of Medicine, University of Toronto. In 1903 Dr. Yin won the distinction. Recent news of him has been

received in Toronto. He is still in active practice somewhere in China.

Until 1928 the degree given to University of Toronto graduates in Medicine was the M.B. Since then it has been M.D. After the union of Trinity Medical College with the Faculty of Medicine in 1903 students who had completed their second and third years in Trinity were given the M.D.C.M. degree on graduation. The M.D. degree was given on presentation of an approved thesis until 1928. Some years ago the Medical Alumnae Association persuaded the Senate to grant the M.D. degree to Toronto Bachelors of Medicine who had been graduates for fifty years. At the recent convocation 13 of these veterans were received by the Chancellor and made Doctors of Medicine. It was a reunion of the surviving members of the class of 1896 and ten of them were present. Those thus honoured were Drs. W. J. Beasley, Windsor; George S. Burt, Owen Sound; William Goldie, Toronto; Andrew Gray, Chippewa; Norman Gwyn, Toronto; W. J. Henderson, Lindsay; C. S. McKee, Vancouver; A. H. Macklin, Goderich; John A. Marquis, Brantford; George More, Shawinigan Lake, B.C.; A. W. Partridge, Burk's Falls; N. W. Price, Plymouth, Mich.; Enoch Roberts, Timmins.

Along with these were ten graduates of Trinity Medical College in the class of 1896. They, having already the M.D.C.M. were received and congratulated by the Chancellor. Doctors Adam Beatty, Toronto; George S. Cameron, Peterborough; W. S. Harper, Port Perry; E. S. Hicks, Brantford; George Krausmann, Niagara Falls, N.Y.; L. H. Marks, Poughkeepsie, N.Y.; J. H. Oliver, Sunderland; W. J. Stevenson, London; Nelson Tait, Toronto; W. H. Weir, Cleveland, Ohio.

Major S. V. Railton F.R.C.S.[C] has been relieved of his military duties and has resumed practice in Port Colborne.

Dr. Dennis Jordan of Toronto was called to Ottawa last month to consult with the Federal Department of Health on plans to extend medical services to the Eskimo people. Dr. Jordan has twice visited Baffin Land and has concrete ideas on the needs of these primitive Canadians. Dr. Walter L. Crewson of Hamilton has also visited the Eskimo and gave the Toronto Academy an illustrated lecture entitled "An oculist's experience in the Arctic".

M. H. V. CAMERON

Quebec

La Société Médicale des Hôpitaux universitaires de Québec a élu pour 1946 le bureau suivant: le Dr. Renaud Lemieux devient président; le Dr J. Petitclerc, vice-président; le Dr Ph. Richard, secrétaire, et le Dr S. Leblond, trésorier.

Les autorités de l'Hôtel-Dieu de Montréal feront construire prochainement deux nouvelles ailes: l'une sera affectée aux gardes-malades et l'autre à certains services, tels que les laboratoires, les rayons-X et les dispensaires.

L'Hôpital Ste-Justine a élu pour 1946 l'exécutif suivant: au bureau médical, le Dr L. Coutu est président et le Dr H. Trudel est secrétaire. Le conseil médical comprend les Drs A.-Z. Crépault, G. Lapiere, H. Baril, D. Forest et W. Major. Le Dr E. Dubé demeure Directeur médical.

Il est question de l'érection d'hôpitaux à St-Jérôme, Val d'Or, Joliette et Grand'Mère. A St-Jérôme, les travaux commenceraient dès le printemps.

Le Dr A. Geoffroy a été élu président du bureau médical de l'hôpital St-Eusèbe de Joliette pour 1946.

Le Dr J.-A. Denoncourt des Trois-Rivières devient président du Bureau d'administration de l'Union Médicale pour l'année courante.

JEAN SAUCIER

General

Dr. Chisholm's Appointment to U.N.O.—Dr. G. B. Chisholm, deputy minister of national health in the Department of National Health and Welfare, has been appointed to the U.N.O. technical preparatory committee which has been set up to plan an international health conference.

Calling of a conference to establish an international health organization was first suggested by the Brazilian and Chinese delegations, with Canadian support, at the San Francisco conference early last summer. The technical preparatory committee was set up by the Economic and Social Council of the United Nations and will meet in Paris on March 18.

Members of the committee were appointed by the Council from among the leading medical scientists of the 50 member states of U.N.O.

The Canadian Home Economics Association will hold its biennial convention July 2 to 5 at the C.P.R. Hotel "The Pines" at Digby, N.S. A short refresher course on teaching methods will be held immediately afterwards. Address inquiries to the Publicity Committee, 373 Quinpool Road, Halifax, N.S.

The Fort Norman hospital of the Indian Health Branch of the Health Department was destroyed by fire on February 22. Seventeen patients at the hospital were removed without injury.

The hospital, near the Norman Wells on the Mackenzie River, was destroyed a half hour after the fire started. Arrangements are being made to fly the 17 patients to the nearest available hospitals at Aklavik to the north and Simpson to the south.

Hon. Brooke Claxton, Health Minister, who made the announcement, paid tribute to the staff for the "splendid work" done in quickly evacuating the hospital. He said loss of the building was serious as it was "the only hospital serving an area of 4,000 square miles".

Steps will be taken at once to replace the hospital, according to the Hon. Brooke Claxton.

The hospital built in 1940, had just acquired new x-ray facilities and was equipped to handle major surgery.

Psychiatric Personnel Placement Service.—The American Psychiatric Association and the National Committee for Mental Hygiene jointly announce the appointment of Captain Forrest M. Harrison (M.C.), U.S.N., as Director of a newly established Psychiatric Personnel Placement Service. The service is designed especially to help physicians and psychiatrists make contacts with training opportunities such as residencies, postgraduate courses and fellowships, and to aid institutions in locating suitable candidates for appointments. Physicians interested in psychiatry are invited to send in full biographical statements including personal data, education, training, experience and special desires, in order that this service may be of the greatest possible assistance to them.

Inquiries should be addressed to Captain Forrest M. Harrison (M.C.), U.S.N., National Committee for Mental Hygiene, 1790 Broadway, New York City 19.

The appointment of **Dr. F. S. Burke**, of Ottawa, as chief of the division of blindness control, Department of National Health and Welfare, is announced. As head of the new division Dr. Burke will undertake a thorough investigation of the whole problem of blindness, including prevention, treatment and training. Prior to his present appointment Dr. Burke was in charge of the foreign relations section of the Department of Veterans' Affairs and medical adviser to the Department of Finance on pensions to civilian blind.

A graduate of the University of Toronto, Dr. Burke served overseas for five years in World War I. He came to Ottawa in 1929 after having been for some

years director of medical services for the Toronto Department of Health.

The appointment of **Col. E. L. Stone, C.M.G.**, of Ottawa, as chief administrative officer and of **Dr. Herbert Meltzer** of Ninette, Man., as medical director of the Edmonton Indian Services Hospital is announced by the minister of National Health and Welfare.

Col. Stone will also be senior administrative officer for Indian health services in Alberta, the Northwest Territories and Yukon, while Dr. Meltzer will be available in a teaching or consultative capacity to the University of Alberta's medical faculty and for provincial tuberculosis control work.

A graduate in medicine from Queen's University, Col. Stone served in the Royal Canadian Army Medical Corps in World War I and was named C.M.G. for his outstanding work. He joined the government service in 1922 and was stationed at Norway House, Manitoba, in charge of Indian medical services until 1928 when he came to Ottawa. In 1940 he left his post as superintendent of medical services, Indian affairs branch, Department of Mines and Resources, to rejoin the R.C.A.M.C., in which he served as embarkation medical officer and later as medical adviser to the director of movement.

Dr. Meltzer graduated in medicine from the University of Manitoba in 1929 and did postgraduate work in New York City, Minneapolis and Ann Arbor. For a time he engaged in general practice at Baldur, Man., later becoming senior physician at the Ninette sanatorium. From 1935 until his enlistment in the Royal Canadian Army Medical Corps in 1941, he was chest surgeon for the Sanatorium Board of Manitoba. He recently returned from overseas where he served as a surgical specialist.

Sir Heneage Ogilvie, K.B.E., M.D., M.Ch., F.R.C.S., has been appointed Editor of *The Practitioner* in succession to Dr. Alan Moncrieff, M.D. F.R.C.P., who has resigned on his appointment to the Nuffield Professorship of Child Health at the University of London. Sir H. Ogilvie, who received his knighthood in the New Year Honours list for distinguished services during the War, is Surgeon to Guy's Hospital, a Vice-President of the Royal College of Surgeons, Honorary Major-General and Consultant Surgeon to the British Army.

Professor Moncrieff has been Senior Editor of *The Practitioner* since 1943 when he succeeded the late Sir Humphry Rolleston, Bt. Dr. William A. R. Thomson who joined *The Practitioner* in 1941 will continue as Associate Editor.

The Canadian Foundation for the Advancement of Pharmacy has raised \$46,120.00 since its inception in September of last year. These funds have been subscribed by 62 contributors, the majority of whom are manufacturers of drugs, pharmaceuticals and toilet goods, wholesale drug companies and those engaged in allied trades.

A maximum of ten thousand dollars has been placed at the disposal of the committee on grants to implement the Foundation's educational program for the fiscal year 1946-1947. This program includes scholarships, teaching fellowships, graduate fellowships, graduate assistantships and research in pharmacy.

The committee on extension services is presently preparing their recommendations for assisting provincial associations in making available refresher courses to retail druggists so that those now directly engaged in pharmacy may obtain the latest information and knowledge regarding new drugs and prescription procedure.

The Foundation hopes to raise more than \$100,000 in 1946 as an initial fund to provide working capital and it is believed that this fund will be added to by annual contributions from many companies and individuals who are interested in the advancement of pharmacy in Canada.

The Foundation is considered as a charitable organization by the Department of National Revenue within the meaning of the income tax laws. This should prove of interest to the many firms who are considering a donation.

The American Society of Plastic and Reconstructive Surgery announce the publication of an official periodical to be known as *Plastic and Reconstructive Surgery*. The first number will appear in July and the journal will be issued bimonthly. One volume of 500 pages will be issued each year and the subscription price will be \$6.00. Dr. Warren B. Davis, of Philadelphia, will be the editor and he will have the assistance of a board of twelve Associate Editors. Subscriptions should be sent to the publishers, the Williams & Wilkins Company, Baltimore 2, Maryland.

New Journals.—The Washington Institute of Medicine announces the publication of two new quarterly journals, namely, the *Quarterly Review of Psychiatry and Neurology* and the *Quarterly Review of Urology*. The first issues of these will appear shortly. Further information may be obtained from the Washington Institute of Medicine, 1720 M Street, N.W., Washington 6, D.C.

Gifford Edmonds Prize in Ophthalmology.—The prize of £100 awarded every two years is offered for the best Essay on a subject dealing with Ophthalmology and involving original work, and is open to any British Subject holding a medical qualification. The subject for the next essay is: "The Intra-ocular Foreign Body". Preference will be given to original work based on any branch of the subject, rather than to compilations of the writings of previous observers. Essays must be sent in not later than December 31, 1946. A leaflet giving full particulars of the prize may be obtained from the Secretary, Royal London Ophthalmic Hospital (Moorfields Eye Hospital) City Road, London, E.C.1, England.

Manuscripts Invited for Norton Medical Award.—The book publishing firm of W. W. Norton & Company announce that they are again inviting manuscripts for submission to be considered for the Norton Medical Award of \$3,500 offered to encourage the writing of books on medicine and the medical profession for the layman. The first such award was made to *The Doctor's Job*, Dr. Carl Binger's book, published last spring, which gave the doctor's point of view on his work. Announcement will be made shortly of the winning book for 1946. Closing date for submission of manuscripts this year is November 1, 1946. All particulars relating to requirements and terms may be had by addressing W. W. Norton & Company Inc., 70 Fifth Avenue, New York 11, N.Y.

The American Association for the Study of Goitre will hold its annual meeting at the Drake Hotel, Chicago, Ill., June 20 to 22.

A new catalogue of technical books has just been issued by The Chemical Publishing Co., Inc., 26 Court Street, Brooklyn 2, N.Y. This catalogue includes the latest books on chemistry, physics, science, technology, medicine, foods, formularies, drugs and cosmetics, engineering, metals, technical dictionaries, building construction, etc., with the date of publication of each book as well as price, number of pages, detailed descriptions and full table of contents. A copy of this catalogue will be sent free to everyone who is interested in keeping up with the latest technical and scientific progress.

The University of Illinois College of Medicine has arranged a one week didactic and clinical refresher course in Otolaryngology for Specialists in the field, from May 13 to 18, 1946, inclusive. Applications for registration should include school of graduation, train-



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ing and experience. Check for tuition (\$50.00) should accompany the application.

In addition, a special course in Broncho-Esophagology will be given from June 3 to 15, 1946, inclusive. It will consist of lectures, animal and cadaver demonstrations, diagnostic and surgical clinics.

The course will be under the direction of Drs. Paul H. Holinger and Albert H. Andrews, Jr.

Tuition for this Course is \$100.00. Cheque should accompany application. Class limited to twelve physicians.

For further information address: Department of Otolaryngology, University of Illinois College of Medicine, 1853 West Polk Street, Chicago, Illinois.

BOOK REVIEWS

Principles and Practice of Rectal Surgery. W. B. Gabriel, M.S.(Lond.), F.R.C.S.(Eng.), Surgeon to the Royal Northern Hospital. 3rd ed., 432 pp., illust. 45s. net. H. K. Lewis & Co. Ltd., London, England, 1945.

This is a new edition by this distinguished author on a subject becoming increasingly important in surgical practice. It contains a new concept of rectal anatomy, a new chapter on proctitis and some new ideas on a very troublesome condition to treat, pruritus ani. There are many excellent photographs, some of which are in colour. Not many surgeons on this side of the water are enthusiastic about oil anaesthetics, finding them not very efficacious and prone to produce sterile abscesses; nor is the coccyx removed in rectal excision. Very few employ the perineal abdominal excision, in preference to the abdominal perineal. Few anaesthetists will agree with the frequent changes of position required for the former procedure; nor is the absolute quiet recommended postoperatively in keeping with the present trend. This, however, is a handy treatise, which not only tells you what to do, but how to do it, and certainly Gabriel's results speak for themselves. It should be on the desk of everyone interested in this subject.

Osseous System. V. W. Archer, Professor of Roentgenology, University of Virginia. 320 pp., illust. \$5.50. Year Book Publishers, Inc., Chicago, 1945.

The author's purpose in writing this book, as set forth in the foreword, is to furnish a guide to those who do occasional x-ray work. He has accomplished something far beyond this modest estimate of his work. It can be read with great profit by every practitioner who has to deal with abnormalities of bone, all of which, whether resulting from congenital anomaly, trauma or disease, are dealt with in this small book.

The text has been boiled down to a minimum and should be regarded as a primer rather than an encyclopaedia. The book should be looked on as pointing to the next step rather than giving the whole answer. As is emphasized throughout the text, there are relatively few simple radiologic examinations, and the occasional radiographer should always think of the maxim, "what might it be besides what I think it is?" For example, there may be an obvious fracture, but it may be pathologic on close inspection.

Although the complete anatomical and pathological description of each condition is not set forth, no apology is necessary on that score. The book is useful and attractive because the author has made the treatment of each subject brief and practical. It serves to remind the reader of the many disturbances, common and rare, which can exist in the bones of the human body. Opposite to each page of the text, a series of x-ray reproductions are placed, illustrating, in a most convenient way, the description of the x-ray findings,

practical points in technique and the many pitfalls which are met with in the interpretation of the films.

Textbook of Surgery. American Authors, Edited by F. Christopher, Associate Professor of Surgery, Northwestern University Medical School. 4th ed., 1548 pp., illust. \$11.50. W. B. Saunders Company, Philadelphia; McAinsh & Co., Toronto, 1945.

One of the principal reasons for the success and popularity enjoyed by this book is the frequency with which revisions have appeared in an attempt to keep the current volume up-to-the-minute. The present edition is the fourth volume in nine years, and is a compilation by the author of contributions by well over two hundred writers on this continent on general surgery and its associated branches. In this book an eminently successful attempt is made to give a "cross-sectional presentation of the best in American surgery". The difficult task of selecting suitable contributors for each subject has been admirably carried out, and one can confidently consult the pages of this volume for authoritative opinions based on wide experience.

The book is inevitably becoming rather large for undergraduates. Although the texts may in places be found not sufficiently exhaustive for postgraduate reading, the lists of references at the end of each article will assist those who require further information. At the moment the book occupies a unique position, and is to be heartily recommended.

Pathology of Tropical Diseases. An Atlas by Colonel J. E. Ash, M.C., U.S.A. and Sophie Spitz, M.D., C.S., A.U.S. 350 pages, 941 illust., 15 in colour, on 257 plates. Price \$9.25. W. B. Saunders Co., Philadelphia and London; McAinsh & Co., Toronto, 1945.

The praise with which Surgeon General E. R. Stitt prefaces this atlas is not at all overdone. It is literally a splendid work, well illustrated and comprehensive. The style and format leave little to be desired. It will probably hold interest and remain fresh for several decades before scientific progress leaves its usefulness behind.

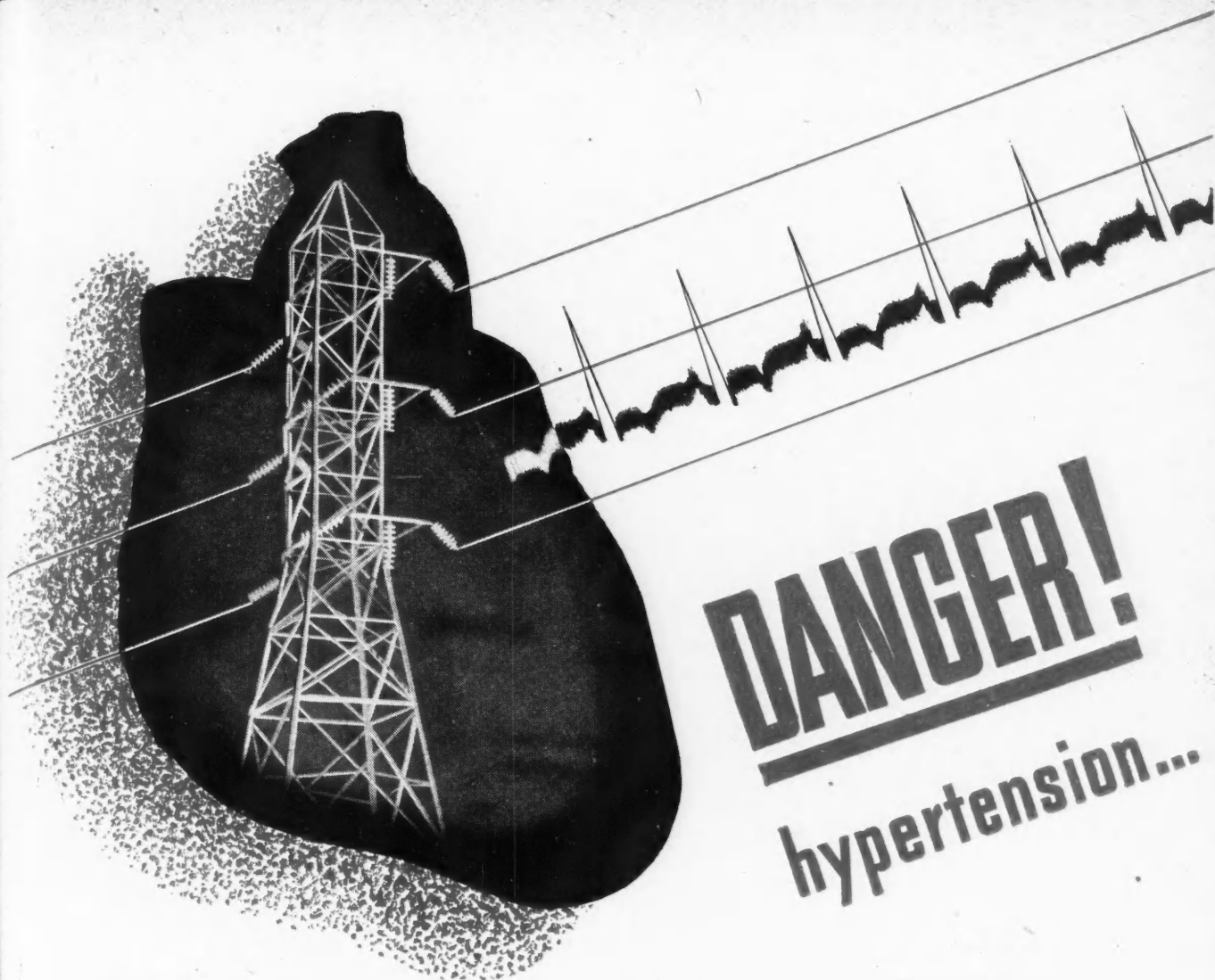
The contents, some twenty-two chapters, are arranged according to etiological classification. Separate chapters deal with the viruses, the dysenteries, malaria, the rickettsias, fungus diseases, dermatoses, treponematoses, deficiency diseases, parasitic infestations and a host of other tropical and exotic diseases.

Each chapter, after defining its subject, continues with a brief outline of the salient epidemiological and clinical features characteristic of the disease. The main emphasis, however, is laid upon pathology, detailing the gross and microscopic tissue changes which occur in the human host. Parasitology in relation to pathology is given the prominence it deserves. The helminths' cycle of life is graphically charted to show the transmission from vector to human host. Some excellent plates illustrate the finer points in the deficiency diseases and tropical dermatoses. The geo-medical maps accompanying the chapters set forth the endemic and epidemic reservoirs of tropical disease and indicate the concentration areas of the disease vectors.

The references are carefully selected and kept at a minimum. The index is in keeping with the careful compilation of the subject matter. Very few medical works deserve such commendation from a reviewer but this volume is an exception.

Psychiatry in Modern Warfare. E. A. Strecker, Professor of Psychiatry, School of Medicine, University of Pennsylvania, and K. E. Appel, Assistant Professor of Psychiatry, School of Medicine, University of Pennsylvania. 88 p. \$1.50. Macmillan, Toronto, 1945.

This book presents an interesting review and comparison of military psychiatry in World Wars I and II. The viewpoint of the authors is indicated in the preface. They consider that experience of the first



Like a high-tension line, the condition of hypertension represents a graver *potential* than actual danger. Anxiety, worry and nervous excitability are the real threats which must be avoided at all costs.

Once the tests have been made, the results checked and the diagnosis confirmed, it is

not enough for the doctor to warn his patient to relax and be calm. *Active* measures are needed. In the past many experimental therapies have been attempted in hypertension. Yet to-day the treatment of choice can apparently still be summed up in two words: *Diuretics, Sedatives*. 'Tabloid' 'Theoba', combining as it does in one product the *diuretic* action of theobromine and the *sedative* action of phenobarbital supplies a convenient and satisfactory answer to the physician's problem.

Each product contains:

Theobromine gr. 5 (0.324 gm.)

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World War was too lightly regarded; they state that neuropsychiatry is the greatest medico-military problem; they are impressed by the greatly increased magnitude of the problem in this latter war.

The changing methods and stresses of warfare are discussed. In the section of organization the inadequacies of establishment in the surgeon-general's office are lamented. Little mention is made of the important and difficult subject of organization in the field. Papers dealing with psychological effects on civilians are briefly reviewed. In the sections on etiology, symptomatology, psychopathology and treatment, selected publications from both wars are reviewed at some length. The authors accept statistics which show an increase in neuropsychiatric battle casualties in proportion to total battle casualties from 1 to 7 in World War I to 1 to 3 in World War II. (The reviewer, with some experience in collecting and comparing such campaign statistics in a theatre of operations, doubts the validity of evidence suggesting such a relative increase in battle psychiatric casualties). The review and critical comparison of symptoms, treatment and results in the two wars is useful and interesting. One regrets that there is no reference to some of the experiences and opinions of certain American, British and Canadian neuropsychiatrists with prolonged field experience in World War II. That lack is partly because the work of certain experienced men has as yet been published only in official reports. The increased recognition of psychosomatic conditions in this last war, and the preponderance of anxiety states over hysteria are given due reference. The increased awareness in World War II, of inadequacies of psychiatric teaching in medical schools, is discussed.

The second smaller section of the book is a well written brief treatise on the psychological and social problems related to the demobilization and return to civilian life of service personnel. The need for improved veteran facilities is emphasized with impressive figures illustrating the magnitude of the post war problem in dealing with neuropsychiatric cases from both wars.

Pædiatric X-ray Diagnosis. J. Caffey, Associate Professor of Pædiatrics, College of Physicians and Surgeons, Columbia University. 838 pp., illust. \$12.50. Year Book Publishers, Chicago, 1945.

This book should be very well received by the medical profession, particularly by pædiatrists and radiologists, as it is the first book published on the subject in English in the past 35 years. The only previous one in English, Rotch's "The Roentgen Rays in Pædiatrics" appeared in 1910. This book stems from the x-ray conferences held at the Babies Hospital in New York during the last 20 years. The purpose of the author is twofold: description of shadows cast by normal and morbid tissues, and clinical appraisal of roentgen findings in pædiatric diagnosis. Roentgen technique and therapy have been intentionally omitted. A survey of the book shows that the author has very adequately covered the normal and abnormal in x-ray diagnosis in children. The plates are numerous and excellent. The volume is divided into six sections: The Head and Neck, The Thorax, The Abdomen and Gastro-Intestinal Tract, The Pelvis and Genito-Urinary Tract, The Extremities and The Vertebral Column. Each section commences with a description of the anatomy and growth and development of the part, followed by the normal x-ray appearance. Then follows in order congenital defects, traumatic lesions, infections, hypovitaminoses, diseases of the blood, neoplasms. There is a valuable chapter on intracranial pneumography with illustrative plates. Excellent chapters on the pneumonias and primary pulmonary tuberculosis can also be cited. Indeed there is so much of interest in this book and it is so well illustrated that it can be highly recommended as a text not only for roentgenologists but to all students and practitioners interested in children.

Bacteriology and Allied Subjects. L. Gershenfeld, Professor of Bacteriology and Hygiene, Philadelphia College of Pharmacy and Science. 561 pp., illust. \$6.00. Mack Publishing Co., Easton, Penn., 1945.

The reviewer wondered how the magnificent list of subjects in the table of contents could be handled in 538 pages of discussion. The text gives the answer. In many places it is practically an annotated bibliography. Condensation of subject matter is so extensive as to demand a very considerable knowledge of bacteriology for the book to be read intelligibly. The beginning student would find it extremely difficult unless he amplified his reading by frequent resort to the very generous supply of references included in the text. For example, in dealing with growth curves in half a page, terms such as logarithmic growth phase are used without definition, and the explanation of these phenomena is dismissed with: "Numerous factors (many are self-apparent) influence the different phases. . . ."

Colony characters are almost totally ignored throughout. Nothing in the text would indicate any differences in difficulties of culturing coliforms and *Brucella*, or any differences in the resultant culture. Nor would the descriptions of *Hæmophilus* create a picture of the familiar appearances. This is a serious handicap to students, even though space is thereby provided for a more complete discussion of applied bacteriology.

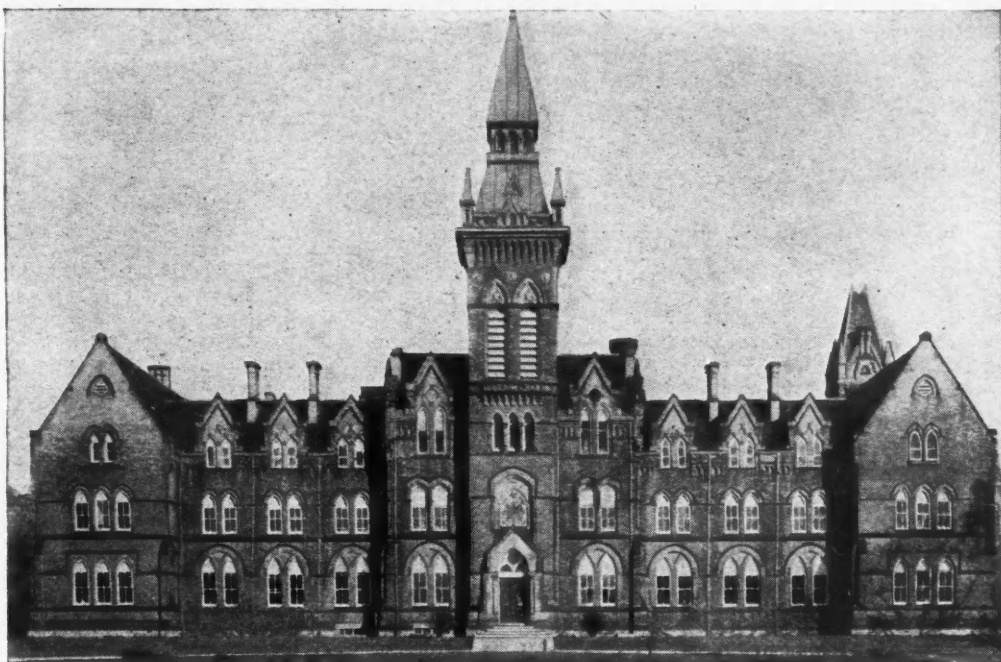
For the most part the factual matter is well covered, although there is a noticeable lack of mention of many important correlations of these facts. For example, the Griffiths and Lancefield analyses of the Streptococci are referred to only incidentally, and it almost inevitably leads to the erroneous statement that identification of a streptococcus is made mainly on the source of the material and the action on blood agar. No use is made of Griffiths' work at all, yet the author included Rose-now's concept of the encephalitic viruses representing the filterable phase of streptococci.

It is true that bacteriology, pathology, mycology, parasitology, therapeutics, industry, entomology etc. all have a bearing on each other, but no single text can be an encyclopædia. While agreeing, however, with what the author feels to be the limitations of the single-purpose text, the present volume does not altogether provide a solution. Otherwise, for those moderately versed in the subject, the references given are very modern, and the text is remarkably free from typographical errors.

Diseases of the Nervous System. F. M. R. Walshe, Physician in Charge of the Neurological Department, University College Hospital, London. 4th ed., 360 pp., illust. \$4.50. Macmillan, Toronto, 1945.

The first edition of this book appeared in 1940 and now a fourth edition appears in 1945. Both second and third editions were reprinted. Any book with such a history scarcely needs an introduction but one cannot pass an opportunity to have a say in the chorus of approbation that earlier additions called forth and which the present edition equally merits. Those who with pleasure and profit have listened to Dr. Walshe at Queen Square and who as they listened have marked him as a great neurologist and great teacher will recognize in his book the same great knowledge, the same clarity of expression and the same impatience with obscurity in either thought or diction. The original material designed to meet the needs of the student and the general practitioner, adheres closely to the author's design in selection and emphasis. The presentation is simple, the language direct, and the temptation to go too far afield is rigidly avoided.

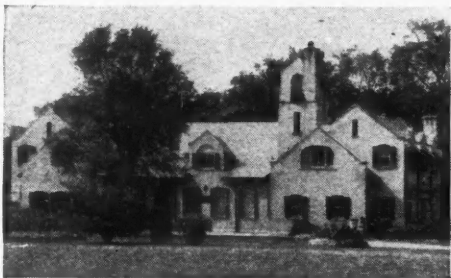
Certain chapters, i.e., those on peripheral nerve lesions, herpes zoster, cervical rib and scalenus anticus syndrome, sciatica and prolapsed disc, have been rewritten, always with clarity and economy in presentation. Incidentally the paging of Herpes in the index is incorrect. An expanded section on etiology is clear and blunt and topples over some long held but



Spadina Crescent Building, providing administration, research laboratories and the production of Penicillin.



School of Hygiene Building, a portion of which accommodates additional research laboratories and the preparation of Insulin and other glandular products.



Virus Research Laboratory, one of the research laboratories in the Dufferin Division, a 145-acre farm property 12 miles north of Toronto.

CONNAUGHT MEDICAL RESEARCH LABORATORIES

In 1914 the preparation and distribution of essential public health biological and related products were undertaken in the University of Toronto in the Antitoxin Laboratory. In 1923 the greatly expanded undertakings were named Connaught Laboratories.

The work of the Laboratories is well known because of the widespread distribution of products. Throughout the years, however, research in preventive medicine has been a primary function. The number of research undertakings has kept pace with the growth of the Laboratories and to-day more than fifty studies are in progress.

To express the fundamental interest of the Connaught Laboratories in research, the Board of Governors of the University of Toronto has approved of the inclusion of the words "Medical Research" in the name of the Laboratories, which will now be known as "Connaught Medical Research Laboratories."

The preparation and distribution of biological and related products will be continued.

CONNAUGHT MEDICAL RESEARCH LABORATORIES
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none the less unjustified beliefs. The rather florid present overgrowth of "psychosomatic medicine" as something startlingly new is properly dealt with.

This is a good book, blessed in more than usual degree by the unmistakable stamp of a great clinician and teacher.

Diseases of the Breast. C. F. Geschickter, Director of the Francis P. Garvan Cancer Research Laboratory. 2nd ed., 826 pp., illust. J. B. Lippincott Company, Montreal, 1945.

In 1943 a review of the first edition of this excellent work was published. By some oversight, the enthusiasm of the reviewer was not emphasized. The second edition has evoked such approval that the omission must be acknowledged and the book recommended without reserve. The chapter on the Mechanism of Tumour Formation has been entirely rewritten. It is a condensed statement of the results of long and careful experimental work. The endocrine basis of cancer of the breast is convincingly presented.

Radical removal with postoperative irradiation has provided the most hopeful method of handling breast cancer. This is proved by statistical studies of large numbers of cases gathered from reports from many centres and the author's own experience.

The book is attractively published, fully illustrated and the bibliography up-to-date.

Bacillary Dysentery Colitis and Enteritis. J. Felsen, Director of Medical Research, Bronx Hospital, New York. 618 pp., illust. \$7.00. Saunders, Phila.; McAinsh, Toronto, 1945.

It is not unfair to look on this work as simply a monograph on bacillary dysentery since it sets forth the view that ileitis and ulcerative colitis are sequelae of dysenteric infection. This view is not accepted by all gastro-enterologists, particularly as regards ulcerative colitis, the genesis of which is still a question in an acutely controversial stage. Although the author does not conceal the fact that he writes from the standpoint of a special pleader, he tries to give a just presentation of the opinions and arguments of those who are as yet unwilling to accept his conclusions. His own contributions to our knowledge of dysentery have been so numerous and valuable that whatever he writes on the subject must be given serious attention by the thoughtful.

There is no work, at present accessible in English, which gives such a complete account of bacillary dysentery. Clinical and laboratory investigators will find the bibliography useful as a means of ready reference and the general practitioner who takes the trouble to gain a grasp of the book's contents will be able to see more clearly the significance of gastro-intestinal upsets, particularly of those upsets which occur in adults. The portion of the book dealing with therapy will, perhaps, be disappointing to many, for the chief reliance is put on supportive measures. The author is in line with modern practice on gastro-intestinal disease when he insists that adequate nutrition far outweighs in importance to the patient any dietary restriction.

The surgeon may feel he is slighted by the implication that his aid should be reserved for complications or for those cases intractable to non-surgical care but no surgeon can validly claim that Dr. Felsen has been deliberately unjust in assessing the results obtained by surgeons who have had a wide experience with ileitis and ulcerative colitis.

There is no serious fault to be found in the numerous illustrations, tables and diagrams nor in the printing. The staccato and slovenly style, however, does little to aid in keeping the interest of the reader. The staccato quality may come in part from the attempt to put much information in a small space but the slovenliness is inexcusable.

Clinical Biochemistry. A. Cantarow, Professor of Physiological Chemistry, Jefferson Medical College, and M. Trumper. 3rd ed., 647 pp. \$7.50. Saunders, Phila.; McAinsh, Toronto, 1945.

The authors of this book have had considerable success in their attempt to obtain the necessary balance in presentation. Their summaries of the normal metabolic processes are full enough to recall the main facts to the reader's mind and allow him to understand the deviations from the normal which occur in the various clinical conditions. The pathological changes which may occur in the metabolism of the various substances discussed (carbohydrate, protein, lipid, calcium, inorganic phosphorus, magnesium, iron, sulphur, iodine, sodium, potassium and chloride, water balance, acid-base balance, respiratory exchange and basal metabolism, vitamins) are dealt with in brief at the end of the section dealing with that particular subject. Following this the chemical pathology of those clinical conditions (diabetes mellitus, renal function, nephrosis, hepatic diseases) in which biochemical changes are an outstanding feature, are discussed in some detail. This is a valuable feature.

The book would be very considerably improved by the more frequent use of tables and figures. For instance the glucose tolerance test is described but neither the normal results nor the pathological variations are illustrated. It is doubtful if the general practitioner and medical student, for whom the book is written, can find a work better fitted to their needs.

Introduction to Diseases of the Chest. J. Maxwell, Assistant Physician and Demonstrator of Practical Medicine, St. Bartholomew's Hospital. 2nd ed., 292 pp., illust. 12/6d. Hodder & Stoughton, London, 1945.

This book is exactly what its title says it is, namely, an introduction to diseases of the chest. It will be appreciated by the medical profession for its straightforward and matter-of-fact manner of dealing with the subject, and by the general practitioner especially, because it places a readable, reliable and accessible source of information at his hand when it is needed. The coverage of the subject is remarkably complete for a book of less than 300 pages. The organization of the book is good: the material is well chosen, the style is concise and lucid but not dogmatic, and practical information supersedes academic discussion. The author recognizes that "the respiratory tract functions as a complete unit", and deals with the subject from that viewpoint. The first three sections of the book discuss the information that can be obtained from the interview, the physical examination and laboratory aids, and interprets, correlates, and evaluates the facts thus obtained in a very satisfactory way. This part deserves careful consideration and alone makes the book valuable. The fourth and largest section gives an account of the maladies of the whole of the respiratory tract. The chapter on Asthma is outstanding, if any one chapter can be so designated. The tuberculosis specialist may think that tuberculosis is not given due prominence, and he may not agree with some of the remarks on oleothorax or the open drainage of tuberculous empyema, but these are problems for specialists, and agreement amongst them has not yet been reached. The statements relative to sanatorium treatment for the tuberculous seem to be at variance with teaching on this side of the Atlantic, but when we remember that our sanatoria undertake hospital treatment as well as sanatorium treatment, and that in America we do not usually distinguish between the two stages of treatment, the apparent disagreement disappears. The appendix of x-ray reproductions adds to the value of the book. Dr. Maxwell has made an acceptable and valuable contribution to the medical literature of our time.

